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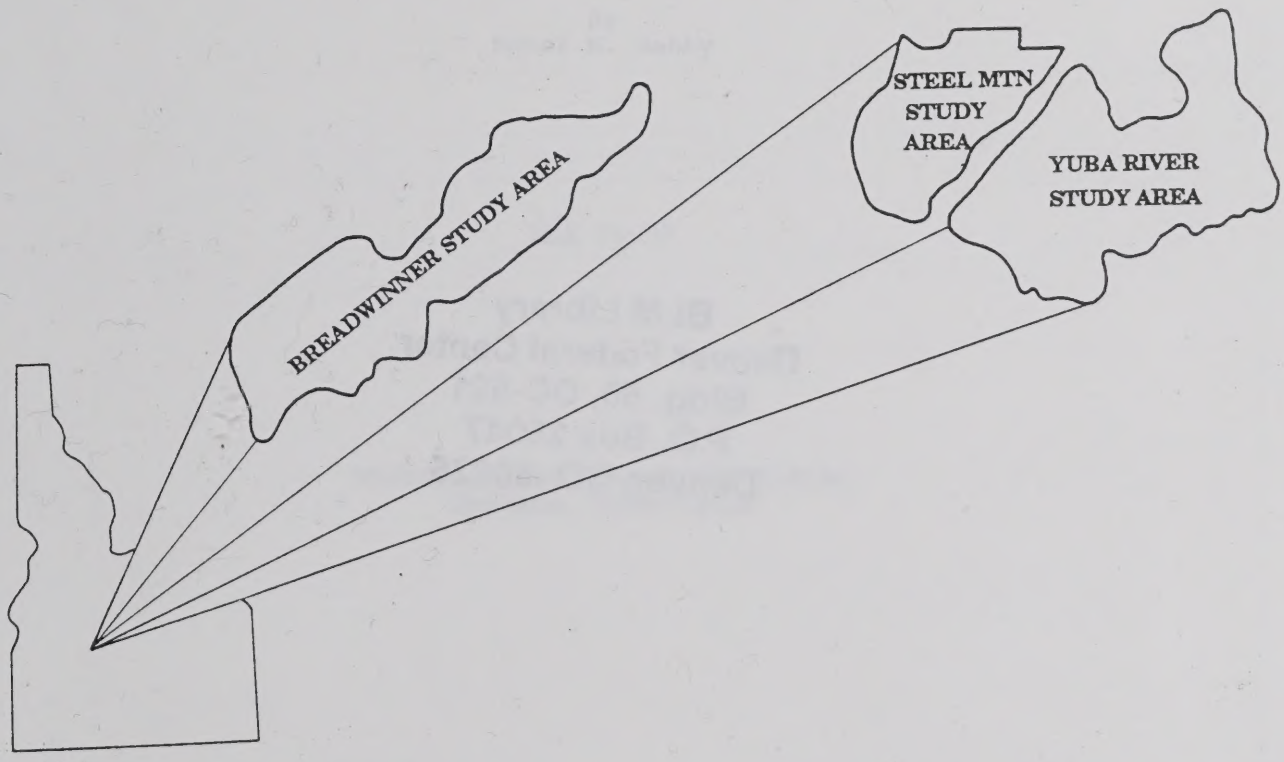

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MINERAL RESOURCE INVESTIGATION OF THE STEEL MOUNTAIN/YUBA RIVER AND BREADWINNER STUDY AREAS, BOISE AND ELMORE COUNTIES, IDAHO

By
Peter N. Gabby

MLA 24-93

Western Field Operations Center
Spokane, Washington

UNITED STATES DEPARTMENT OF THE INTERIOR
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16. Abstract (Limit: 200 words)

In 1992, the Bureau of Mines conducted a mineral resource investigation of the 27,034-hectare Steel Mountain/Yuba River study area and the 16,544-hectare Breadwinner study area. There were approximately 535 lode and placer claims in or partially in the Steel Mountain/Yuba River study area, and 84 lode and placer claims in or partially in the Breadwinner study area.

In the Atlanta and Rocky Bar mining districts, both adjacent to and in the Steel Mountain/Yuba River study area, 30,232.4 kg (972,000 oz) of gold and 62,838.3 kg (2,020,000 oz) of silver had been produced. Most of this production came from outside the study area.

Placer properties adjacent to (and a few in) the Breadwinner study area had production of 93.1 kg (2,992 oz) of gold and 20.0 kg (642 oz) of silver.

Twelve properties in the Steel Mountain/Yuba River study area have potential for resources; eleven have alteration and/or mineralization similar to that found at Atlanta with potential for gold, silver, and tungsten resources, and one has alteration and mineralization associated with polymetallic vein type deposits with potential for gold, silver, copper, lead, zinc, and tungsten resources. Adjacent to the study area, large bars of gold-bearing gravel can be found along the Middle Fork Boise River.

Four properties in the Breadwinner study area have potential for mineral resources; one has alteration and mineralization associated with skarn, polymetallic vein, and, possibly, copper-molybdenum and molybdenum porphyry types of deposits; two have alteration and metal assays associated with polymetallic vein, and
(Over)

17. Document Analysis a. Descriptors

Mineral resources
Elmore County Idaho
Boise County, Idaho
Atlanta mining district
Middle Boise River mining district
Rocky Bar mining district
Twin Springs mining district
Bear Creek mining district
Spanish Town
Mines and prospects

b. Identifiers/Open-Ended Terms

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possibly copper-molybdenum and molybdenum porphyry types of deposits; and one has alteration and mineralization similar to that found at Atlanta. These four have potential for gold, silver, copper, lead, zinc, molybdenum, and tungsten resource.s Adjacent to and extending into the Breadwinner study area are large bars of gold-bearing gravel along North and Middle Forks Boise River.

PREFACE

The Wilderness Act (Public Law 88-577, September 3, 1964) and related acts require the U.S. Bureau of Mines and U.S. Geological Survey to survey certain areas of Federal Lands ". . . to determine the mineral values, if any, that may be present . . . ." Results must be made available to the public and be submitted to the President and Congress. This report presents the results of a Bureau of Mines mineral investigation of the Steel Mountain/Yuba River and Breadwinner roadless areas, Boise and Elmore Counties, Idaho. Previous legislative proposals have recommended these areas be classified as Wilderness. Mining-related activities in the study areas would be severely restricted under these designations.

This open-file report contains data gathered and interpreted by personnel of the Bureau of Mines, Western Field Operations Center, Branch of Resource Evaluation, East 360 Third Avenue, Spokane, WA 99202. The report has not been edited or reviewed for conformity with Bureau of Mines editorial standards.

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UNITS OF MEASURE, ABBREVIATIONS, SYMBOLS, AND CONVERSIONS USED IN THIS REPORT

To conform to the Omnibus Trade and Competitiveness Act of 1988 and Executive Order 12770, dated July 25, 1991, measurements made during this study have been converted to the metric system. Conversions have been done using Federal Standard a, May 5, 1983, preferred metric units for general use by the Federal Government, General Services Administration (GSA). Some information in the appendices, which was copied from other sources, has been left in its original measurement system. Significant precious-metals concentrations are shown in both metric and English units.

Metric Units

cm	centimeter (cm x 0.3937 = inch)
m^3	cubic meter (m^3 x 1.3079 = yd^3)
g	gram (g x 0.029 = oz)
ha	hectare (ha x 2.471 = acre)
<	less than
m	meter (m x 3.28 = ft)
t	metric ton (tonne) (t x 0.9072 = ton)
kg	kilogram (kg x 2.205 = lb)
km	kilometer (km x 0.6214 = mi)
mg	milligram (mg x 0.0000322 = oz)
ppb	part per billion
ppm	part per million
%	percent

English Units

yd^3	cubic yard
ft	foot
mi	mile
lb	pound
ton	short ton
oz	troy ounce
oz/ton	troy ounce per short ton

SUMMARY

In 1992, the USBM (U.S. Bureau of Mines) conducted a mineral resource investigation of the 27,034-hectare Steel Mountain/Yuba River study area and the 16,544-hectare Breadwinner study area. The Steel Mountain /Yuba River area is in Elmore County about 120 km northeast of Boise, Idaho; the Breadwinner area is in Boise and Elmore Counties about 72 km northeast of Boise.

In the Atlanta mining district, on the north side of the Steel Mountain/Yuba River study area, over 35 lode and 60 placer mines produced an estimated 12,441.2 kg (400,000 oz) of gold and 49,453.8 kg (1,590,000 oz) of silver. In the Rocky Bar mining district, on the south side of the study area, over 60 lode and 45 placer mines produced an estimated 17,791.2 kg (572,000 oz) of gold and 13,374.5 kg (430,000 oz) of silver. Most of the production came from outside the study area. The BLM claim records show that approximately 520 lode claims and approximately 15 placer claims are located in or partially in the study area. Numerous placer claims along the Middle Fork Boise River, Yuba River, and Decker Creek are adjacent to the area, but are presumed to be outside the study area.

Sixty-eight placer properties on the Middle and North Forks Boise River, that are adjacent to (and a few in) the Breadwinner study area, had production of 93.1 kg (2,992 oz) of gold and 20.0 kg (642 oz) of silver. The BLM claim records show that 77 lode claims and 7 placer claims are located in or partially in the study area. Almost all of the potential placer ground along the Middle Fork and the North Fork Boise Rivers, and adjacent to the study area, has been withdrawn from mining as part of the Payette/Boise Reclamation Project in 1904, 1909, and 1910; Boise Reclamation Project in 1928 and 1937; and Power Site Withdrawals in 1930.

Most of the Steel Mountain/Yuba River study area is underlain by intrusive rocks of the Cretaceous-age Idaho batholith, and most of the alteration and mineralization in the area is similar to that observed at the adjacent Atlanta gold mining district. Approximately two-thirds of the Breadwinner study area is underlain by Tertiary-age quartz monzodiorite and granite, and the other third by Idaho batholith. In that study area, alteration and mineralization are associated with polymetallic veins, skarns, and Atlanta type mineralization.

The study areas have no identified mineral resources, but twelve properties in the Steel Mountain/Yuba River study area have potential for resources. Eleven of these properties have structurally related alteration and/or mineralization similar to that found at the Atlanta mining district; therefore, there is potential for gold, silver, and tungsten resources. A twelfth property has alteration and mineralization associated with polymetallic vein type deposits, and has potential for gold, silver, copper, lead, zinc, and tungsten. Adjacent to the this study area, large bars of gold-bearing gravel can be found along the Middle Fork Boise River.

In the Breadwinner study area, four properties have potential for mineral resources. One property has alteration and mineralization associated with skarn, polymetallic vein, and, possibly, copper-molybdenum and molybdenum porphyry types of deposits; two properties have alteration and metal assays associated with polymetallic vein, and possibly copper-molybdenum and molybdenum porphyry types of deposits; and one property has alteration and mineralization similar to that found at the Atlanta mining district. Extending into the Breadwinner study

area are large bars of gold-bearing gravel along North and Middle Forks Boise River.

INTRODUCTION

In 1992, the USBM investigated the mineral resources of the Steel Mountain Roadless Area RARE II No. 02012, the Boise National Forest portion of the South Boise/Yuba Roadless Area No. 02914, and the Breadwinner Roadless Area No. 02006. The Steel Mountain Roadless Area and the Boise National Forest portion of the South Boise/Yuba Roadless Area will here after be referred to as the Steel Mountain/Yuba River. These areas were included in wilderness bill H.R. 2213, brought before the 101st Congress, 1st Session. Although the immediate goal of this and other USBM surveys is to provide data for the President, Congress, government agencies, and the public for land-use decisions, the long-term objective is to ensure our Nation has an adequate and dependable supply of minerals at a reasonable cost.

Geographic Setting

The Steel Mountain/Yuba River study area encompasses approximately 27,034-hectares, and the Breadwinner study area approximately 16,544-hectares. Both are in the Boise National Forest, about 16 km apart, and both are bordered by the Middle Fork Boise River. The river forms the south border of the Breadwinner area, and forms the north border of the Steel Mountain/Yuba area (fig. 1). Also, both areas are part of the sprawling, non-linear Boise Mountains of central Idaho.

The Steel Mountain/Yuba River study area (fig. 2) is bounded on the north and west by various Forest Service roads, on the east by a high ridge that is the boundary of the Sawtooth Wilderness or by the Elmore-Camas county lines, and on the south by a ridge separating the South Fork and Middle Fork Boise River drainages, and by roads and mining properties in the Rocky Bar area. FS (Forest Service) Road 126 connects the historic mining towns of Atlanta and Rocky Bar, and separates the Steel Mountain/Yuba River study area into the two separate units. Various trails access the interior of the two units.

The Breadwinner roadless area (fig. 3) is accessed by numerous Forest Roads. Other than for lodging, there are no facilities at the historic placer camp of Twin Springs.

Previous Studies

Steel Mountain/Yuba River study area

Two rock and eleven stream-sediment samples taken in (and one adjacent to) the Steel Mountain/Yuba River study area, and written descriptions of mineral properties in the Atlanta area, were reported on by Kiilsgaard and others (1970) during the USGS/USBM Primitive Area Survey. In the Rocky Bar area several rock samples taken along FS Road 156 and adjacent to the study area were reported on by Benjamin and Federspiel (1991) during their investigation of the Trinities study area. Also, the area of Ross Fork Lakes, adjacent to the Steel Mountain/Yuba River study area, was included in two mineral related studies by Federspiel and others (1987 and 1992) during USBM roadless studies of the South Boise Yuba and Smokies study areas.

Table 1 summarizes the sources of early descriptions, ownership, and production statistics of lode and placer mines in the Atlanta and Rocky Bar mining districts.

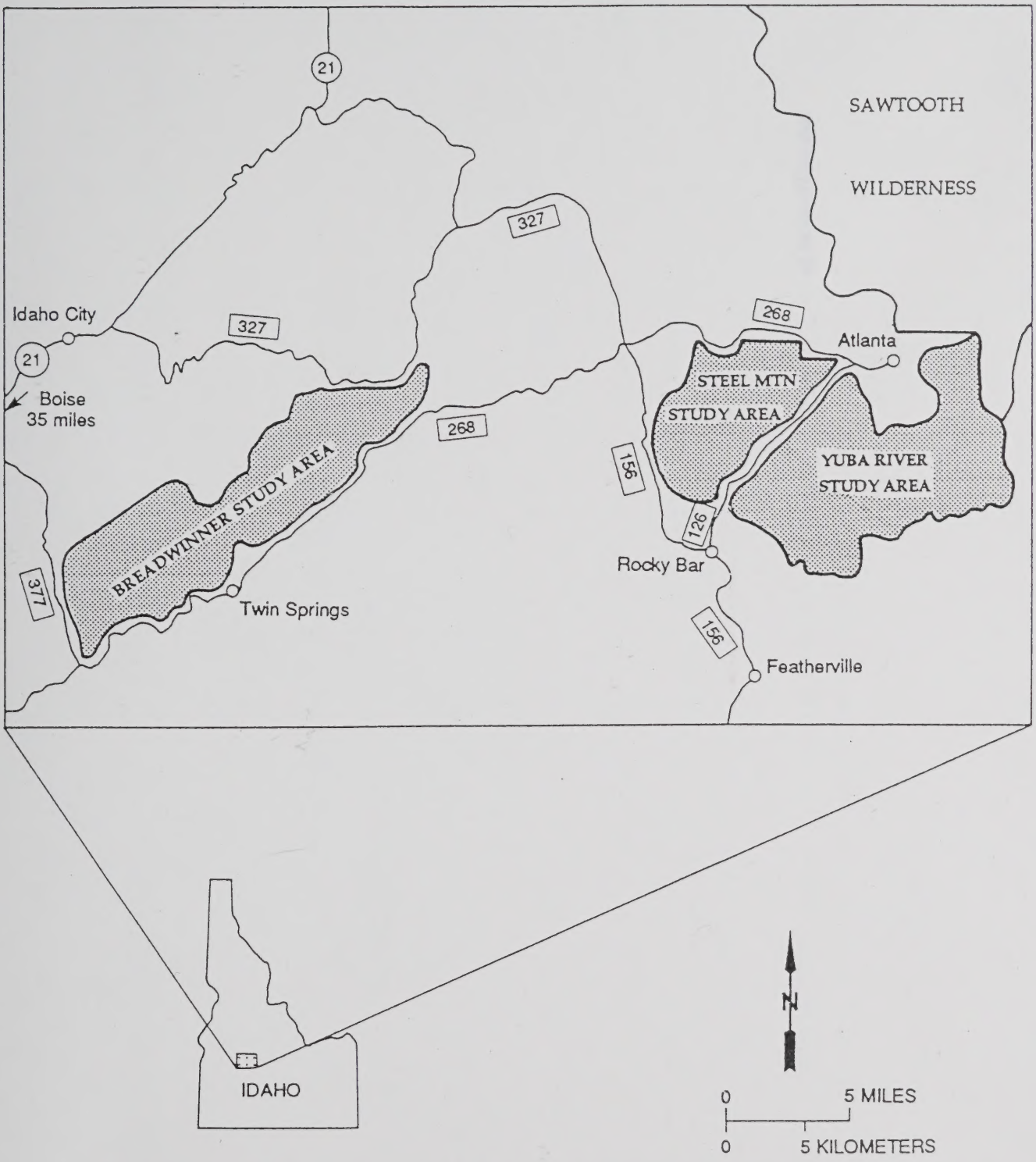
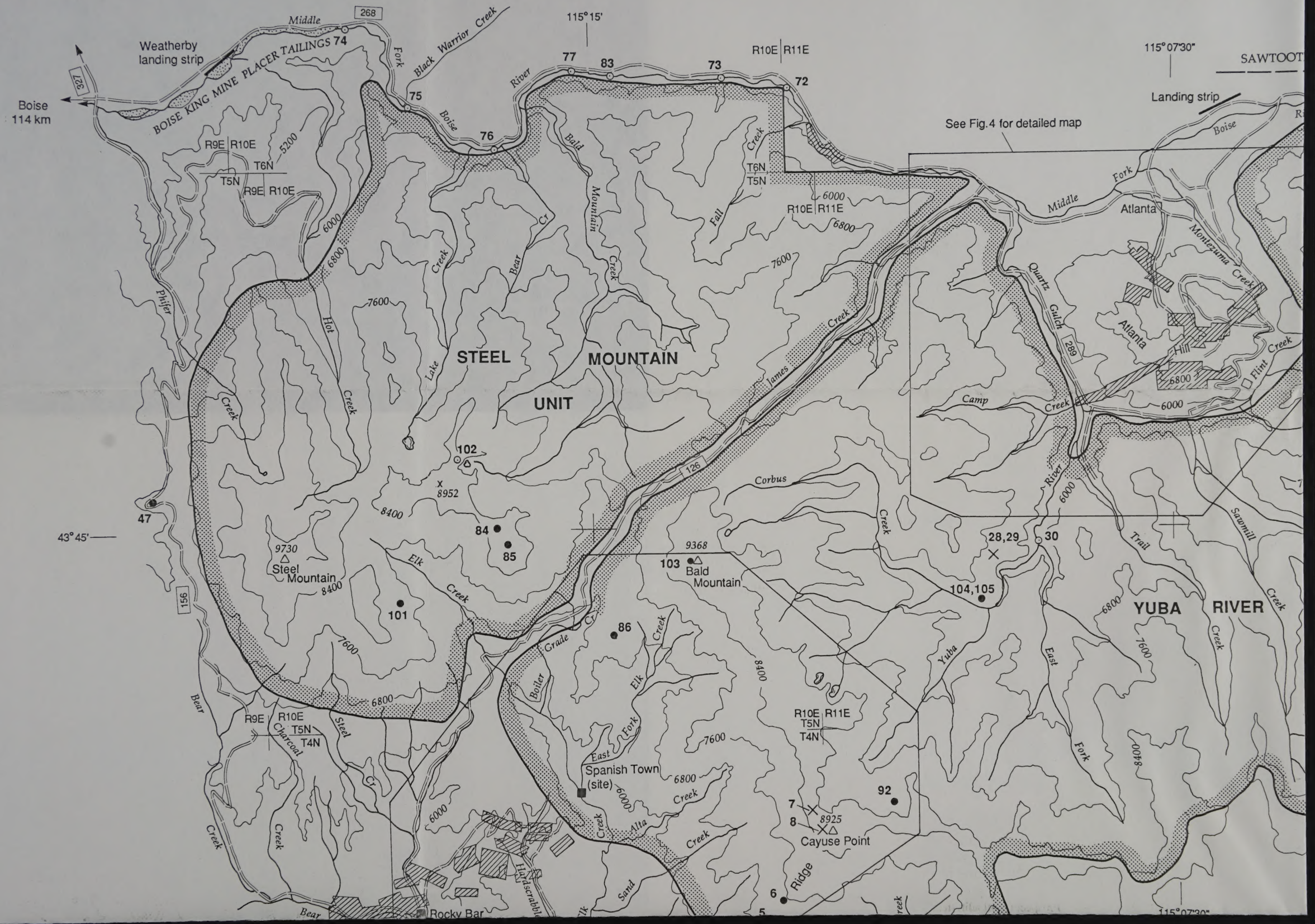


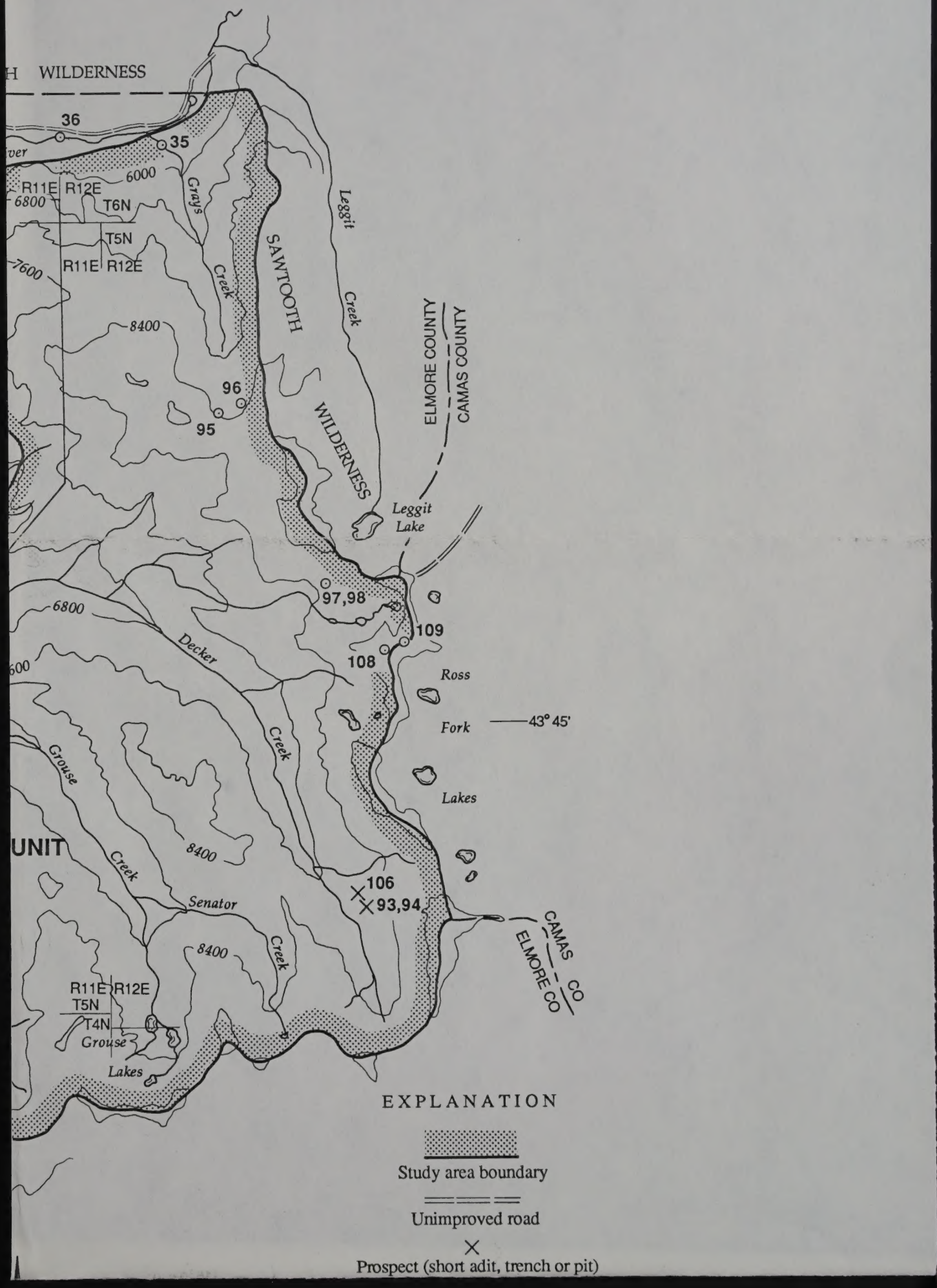
Figure 1.- Locations of the Steel Mountain/Yuba River and Breadwinner study areas, Boise and Elmore Counties, Idaho

.e

.d Boise National

Figure 2.- Prospects and sample localities in and near the Steel Mountain/Yuba River study area (Steel Mountain and Boise National Forest portion of the South Boise/Yuba study areas), Elmore County, Idaho


Middle
Fork
Boise
River
Weatherby
landing strip
268
74
BOISE KING MINE PLACER TAILINGS
Boise
114 km
327
Black Warrior Creek
75
76
77
83
73
72
115°15'
R10E | R11E
115°07'30"
SAWTOOT
Landing strip
See Fig.4 for detailed map
R9E | R10E
T6N
T5N
R9E | R10E
5200
6000
6800
7600
Phifer
Creek
Hot
Creek
Lake
Creek
Bear
Cr
Bald
Mountain
Creek
Fall
Creek
T6N
T5N
R10E | R11E
6000
6800
7600
Middle
Fork
Atlanta
Montezuma
Creek
Quartz
Gulch
289
Atlanta
Hill
Flint
Creek
6800
6000
Camp
Creek
James
Creek
STEEL
MOUNTAIN
UNIT
102
126
x
8952
8400
47
84
85
9730
Steel
Mountain
8400
Elk
Creek
101
156
7600
6800
Bear
Creek
Steel
Cr
R9E
R10E
T5N
T4N
Charcoal
Creek
6000
Rocky Bar
Haldscrabble
Creek
Sand
Creek
Corbus
Creek
9368
103
Bald
Mountain
86
Boiler
Grade
Cr
Elk
Creek
East
Fork
Spanish Town
(site)
6000
6800
Creek
Alta
Creek
8400
7600
R10E | R11E
T5N
T4N
7
8
8925
Cayuse Point
92
6
Ridge
5
28,29
30
104,105
Yuba
River
6000
6800
7600
8400
Trail
Sawmill
Creek
East
Fork
Yuba
River
Creek
43°45'
115°07'30"


H WILDERNESS
36
35
ver
6000
R11E R12E
6800
T6N
T5N
R11E R12E
7600
8400
Grays
Creek
SAWTOOTH
WILDERNESS
Leggit
Creek
ELMORE COUNTY
CAMAS COUNTY
96
95
Leggit
Lake
97,98
109
108
6800
Decker
600
Creek
Ross
Fork
43° 45'
Lakes
Grouse
Creek
UNIT
8400
106
93,94
Senator
Creek
8400
CAMAS CO
ELMORE CO
R11E R12E
T5N
T4N
Grouse
Lakes
EXPLANATION
Study area boundary
Unimproved road
Prospect (short adit, trench or pit)

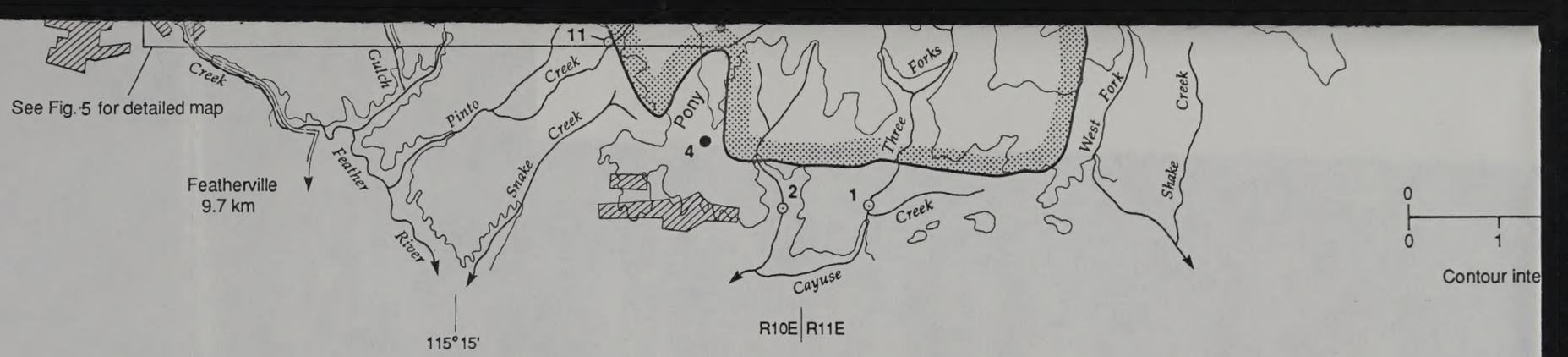


Figure 2.- Prospects and sample localities in and near the Steel Mountain/Yuba River study area (Steel Mountain and Boise National Forest portion of the South Boise/Yuba study areas), Elmore County, Idaho

and sample number

Approximate location of patented mining claims

⊙2

Lode or placer sample locality

●84

Rock sample locality

1 2 MILES

2 3 KILOMETERS

rval 800 feet

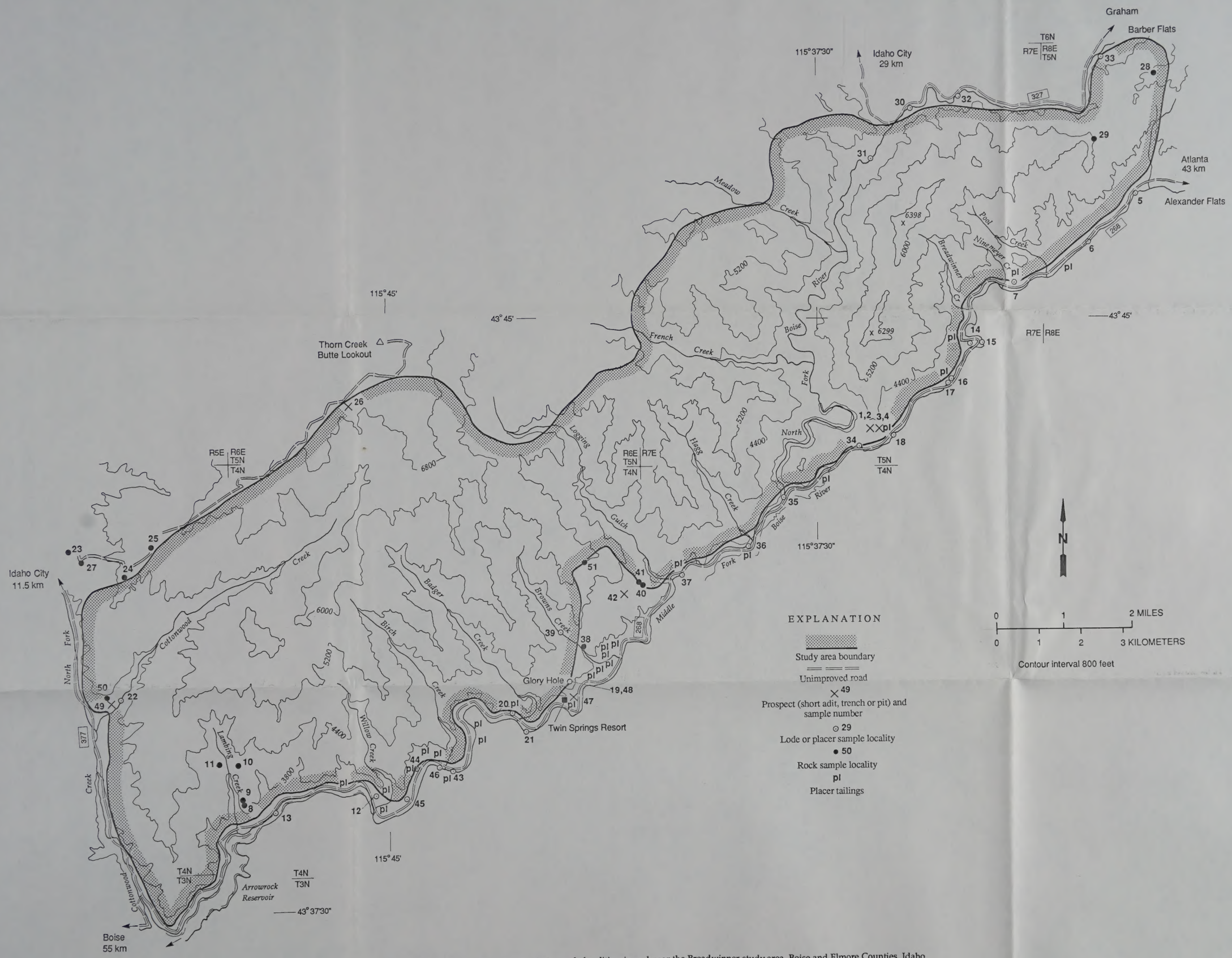
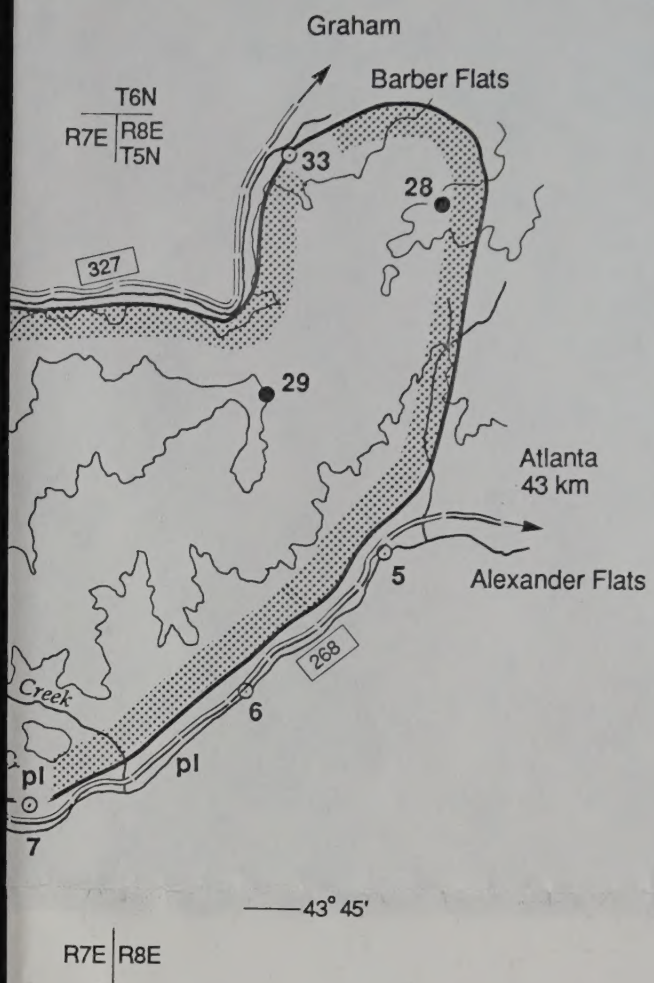
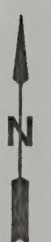


Figure 3.- Prospects, placer tailings, and sample localities in and near the Breadwinner study area, Boise and Elmore Counties, Idaho

115°37'30"
Idaho City
29 km
30
32
31
Meadow
Creek
6398
Pool
Ninemeyer
Breadwinner Cr
6000
5200
River
Boise
Fork
x 6299
14
15
pl
16
17
4400
1,2
3,4
North
34
18
T5N
T4N
35
36
115°37'30"
115°45'
43°45'
Thorn Creek
Butte Lookout
26
French
Creek
Logging
Gulch
Hagg
Creek
6800
R5E
R6E
T5N
T4N
R6E
R7E
T5N
T4N
23
25
27
24
Idaho City
11.5 km
Cottonwood
Creek
6000
Badger
Creek
Birch
5200
North
Fork
50
51
41
42
40
37
Browns
Creek
39
38
Middle
Fork
268
Glory Hole
EXPLANATION
Study area boundary
Unimproved road
0
0





1 2 MILES

1 2 3 KILOMETERS

Contour interval 800 feet

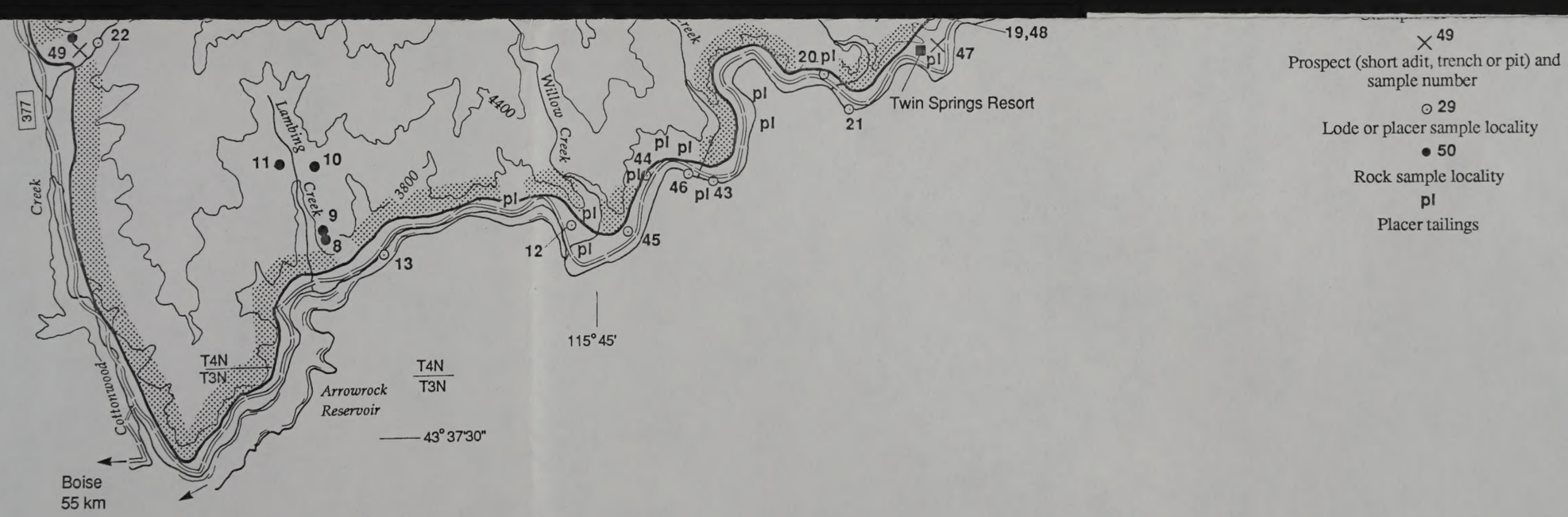


Figure 3.- Prospects, placer tailings, and sample localities in and near the Breadwinner study area, Boise and Elmore Counties, Idaho

Table 1. Summary of early literature reporting 19th Century mining activities in the Atlanta and Rocky Bar mining districts.

Publication Title	Author	Date	Short Remarks
Statistics of Mines and Mining in the States and Territories West of the Rocky Mountains	J. Ross Browne	1868	Atlanta and Rocky Bar (p. 520-521)
Do.	Rossiter W. Raymond	1870	Do.; production data (p. 247-249)
Do.	Do.	1872	Do.; production data (p. 202)
Do.	Do.	1873	Do.; production data (p. 204-205)
Do.	Do.	1875	Do.; production data (p. 305-311)
Do.	Do.	1877	Do.; production data; map and cross section of Ada Elmore mine; report from Atlanta dist. by J. E. Clayton (p. 207-215)
Atlanta District - in - Transactions of the American Institute of Mining Engineers, vol. V	Joshua E. Clayton	1877	Atlanta; map and cross section of Atlanta Lode (p. 468-473)
Resources and Attractions of Idaho Territory	Robert E. Strahorn	1881	Atlanta and Rocky Bar; production data; map (p. 36-42)
Report of the Director of the Mint upon the Statistics of the Production of the Precious Metals in the United States	Director of the Mint	1881	Atlanta and Rocky Bar
Do.	Do.	1882	Do.; production data; map, detail of Atlanta district (p. 173-177)
Do.	Do.	1883	Do.; production data; interesting, but very inaccurate map of Atlanta-Rocky Bar region (p. 197-199)
Do.	Do.	1884	Do.; production data (p. 445-447)
Do.	Do.	1885	Do.; production data (p. 257-259)

Ballard (1928), described and estimated production for lode and placer mines in both the Atlanta and Rocky Bar districts. Later, Anderson (1939 and 1943) reported on the ore deposits of the Atlanta district and the geology of the gold bearing lodes of the Rocky Bar district, respectively. A detailed (but not complete) chronology of property (or claim) ownership, corporate information, development activity, equipment purchases, employment data, and production statistics can be gleaned from the Idaho Inspector of Mines Annual Report(s) (1900-1974) for the years 1899 through 1974; in the U. S. Geological Survey's, Mineral Resources of the United States (1906-1932) annual reports for the years 1905 to 1931; in the U. S. Bureau of Mine's, Mineral Resources of the United States (1934-1952) annual reports for the years 1933 through 1951; and The Mines Handbook and Mines Register for the years 1916 through 1971. Appendix A, tables A-1, A-2, and A-3, list data in these three serial publication, by year and mining district, including all mines, claims, and companies mentioned in the Atlanta and Rocky Bar mining districts.

General geology of the Steel Mountain/Yuba River study area and region is presented in two geologic maps of the Hailey Quadrangle by Rember and Bennett (1979), and Worl and others (1991). More detailed geology appears in a preliminary (unpublished) U. S. Geological Survey geologic map of the area near Atlanta, by Kiilsgaard and Stewart.

Breadwinner study area

One stream sediment, one reconnaissance pan, and several rock samples taken from the southeast side of the Middle Fork Boise River, across from but adjacent to the Breadwinner study area, were reported on by Benjamin and Federspiel (1991) in their Trinities report. A short chronology of property (or claim) ownership, corporate information, development activity, and employment data can be gleaned from the 1921 to 1939 Idaho Inspector of Mines Annual Report(s). Appendix A, table A-4, lists placer mines, placer claims, and companies believed to have operated adjacent to, or near, the study area.

The general geology of the Breadwinner study area and region also is presented in Rember and Bennett (1979), and Worl and others (1991).

Present Study

Prefield work for the USBM Steel Mountain/Yuba River and Breadwinner studies included research of geologic and mineral resource literature, mining claim records, and mine production data. Claimants identified during searches of Elmore and Boise Counties, and BLM (Bureau of Land Management) mining claim records were notified of the study. USFS (U.S. Forest Service) offices of the Boise National Forest also were contacted to obtain information pertinent to the study. Two short reports for the study areas were prepared by Mitchell (1992A and B) of the Idaho Geological Survey for the USBM as part of a cooperative agreement.

Field work was conducted during the summer of 1992. All known mines, prospects, zones of mineralization, and zones of alteration in and near the study areas were sampled, and mapped where warranted. In addition, the areas were traversed by foot and helicopter to search for any mineralized sites not reported in the literature, and reconnaissance placer samples were collected from drainages inside and adjacent to the study area.

Seventy-three rock samples and 33 placer samples (appendix B, tables B-1 and B-2) were taken for the Steel Mountain/Yuba River study area and 23 rock samples and 28 placer samples (appendix B, tables B-3 and B-4) were taken for the Breadwinner study area. There were four sample types: 1) chip - a regular series of rock chips taken in a continuous line across a mineralized zone or other exposure; 2) grab - rock pieces taken unsystematically; 3) select - pieces of rock chosen, generally, from the apparently best mineralized parts of a pile or exposure, or of any particular fraction (e.g. quartz, host rock); 4) placer - 0.07646 m^3 (0.1 yd^3) of surficial sand and gravel partially concentrated in a portable sluice to check for the presence of gold or other heavy minerals. Rock samples were fire assayed with atomic absorption (AA) spectroscopy finish, for gold, and were further analyzed for an 11-element geochemical suite[1], generally using the inductive coupled plasma emission spectroscopy (ICP) or AA, for partially digested samples, method to detect unsuspected elements of possible economic significance. The lower detection limit for gold was 5 ppb. Placer samples, partially concentrated in the field, were checked for radioactivity and fluorescence, and further concentrated on a shaker table. Resulting concentrates were scanned with a binocular microscope to determine heavy mineral content; any gold was hand picked. A gold price of $11.253 per gm ($350.00 per oz) was used to calculate value per m^3 of placer samples.

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[1]Silver, copper, lead, zinc, arsenic, antimony, tungsten, manganese, bismuth, molybdenum, and mercury.

Rock and placer sample analytical results are tabulated in appendix B. Sample localities are shown on figures 2-5.

ACKNOWLEDGEMENTS

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GEOLOGIC SETTING

Steel Mountain/Yuba River study area

Most of the Steel Mountain/Yuba River study area is underlain by biotite granodiorite, pegmatite dikes, and leucocratic granite of the Atlanta lobe of the Cretaceous Idaho batholith (Mitchell, 1992A; and Worl and others, 1991). According to Thornbury (1965, p. 385), "The lithologic homogeneity of the Idaho Batholith is well expressed in (the area's) ...sprawling mountains with dendritic drainage and little lineation of topography." There also are numerous Tertiary-age rhyolite, andesite, and basalt dikes. The west side of the area, in the vicinity of Steel Mountain, is underlain by Tertiary granite and quartz monzodiorite dikes.

In and adjacent to the study area, gold mineralization is associated with zones of altered biotite granodiorite. These zones are commonly silicified with quartz veinlets, nearly complete replacement by quartz with phantom inclusions of altered granodiorite, or drusy and comb quartz. The zones also have abundant sericite, some argillite, and minor chlorite and epidote. A pervasive feature, easily recognized in the field, is the absence of biotite in or near these altered zones; these areas of light colored rocks can be confused with pegmatite dikes. In addition to the alteration assemblage, mineralized material contains pyrite and arsenopyrite and the oxidized products of these minerals, iron oxide pseudomorphs after pyrite, the yellowish-green pharmacosiderite, and minor siliceous iron oxide boxwork. One mineralized structure on the east side of the study area also contains galena and sphalerite.

The nearby Atlanta Hill lodes have similarities to the alteration and mineralization observed in the study area. Anderson's report (1939, p. 30-31) on the Atlanta district describes the gangue minerals as being dominated by massive fine-grained quartz containing numerous phantom inclusions of altered country rock, coarse comb and drusy quartz, and sericite. At Atlanta, arsenopyrite is the most abundant metallic mineral, followed by pyrite, minor galena, and very minor sulfides of copper and zinc. Most gold probably is associated with metallic sulfides (Anderson, 1939, p. 23-28). Tertiary dikes in the Atlanta district are post mineralization (Lance Bacon and Frank Hingley, Atlanta Gold Corp., oral commun.).

The nearby Rocky Bar mining district lodes are described by Anderson (1943, p. 15-24) as being more compact then the Atlanta district's deposits: tabular fissure-filling quartz veins; negligible amounts of wallrock replacement; and wallrock alteration showing disappearance of biotite and formation of sericite that penetrates less than 1 meter into wallrock. At Rocky Bar, arsenopyrite is also the most abundant metallic mineral found in gold-bearing quartz veins, followed by sphalerite and galena, and minor pyrite.

Breadwinner study area

Approximately two-thirds of the Breadwinner study area, mostly southwest

of French Creek and sample sites 1 through 4 (fig. 3), is underlain by Tertiary quartz monzodiorite and granite. The northeastern part is underlain by biotite granodiorite of the Cretaceous Idaho batholith. The batholith rocks also crop out in the southwest and northwest corners of the study area. Both Tertiary- and Cretaceous-age plutonic rock types contain Tertiary rhyolite and rhyodacite dikes.

In and adjacent to this study area there appears to be differences in the type of mineralization found in the Tertiary and the Cretaceous rocks. In the batholith rocks gold and silver mineralization is found at the Hy Country property (sample localities 2 and 3, fig. 3) in an alteration zone that contained quartz vein, quartz veinlets, fractured and altered granodiorite, and pyrite. Besides containing ore grade gold and silver, this mineralization also contains anomalous amounts of arsenic and molybdenum, and elevated amounts of lead and zinc. In the Tertiary quartz monzodiorite and granite rocks in the Twin Springs area (sample 42 locality), as well as a prospect in sec. 23, T. 4 N., R. 5 E. (sample localities 49 and 50), and the prospect in sec. 32, T. 5 N., R. 6 E. (sample locality 26), altered and mineralized material was found that contained quartz veins, quartz veinlets, sericite, and pyrite. Also found in the Twin Springs area (sample locality 47) is a fine- to medium-grained biotite granite that contains seams and blebs of coarse quartz, feldspar, and epidote, with pyrite, molybdenite, and chalcopyrite; and (sample locality 51) plutonic rocks that contain dark lead- and zinc-bearing manganese and iron oxides filling seams and staining fractures. As opposed to the Cretaceous batholith rocks, mineralization in Tertiary plutonic rocks is found in general to contain more base metals (copper, lead, zinc, and antimony) and less gold and arsenic. Also, of the 23 total lode samples taken in the study area, only seven contained detectable bismuth, six of which come from mineralization in Tertiary plutonic rocks; this includes the five highest assays (18 ppm to 165 ppm).

MINING HISTORY

Wells (1964, p. 3) reports that a Hudson Bay Company trapper knew about gold in Boise Basin by 1844, but a rush wasn't started until prospectors from Florence, Idaho, and Auburn, Oregon, made discoveries during the summer and fall of 1862. These rich placers spurred the rapid advance of prospectors up the drainages of central Idaho's rugged mountains, which led to the following major placer discoveries: 1863--up the South Boise River drainage and into the Rocky Bar-Featherville area (adjacent and southwest of the Steel Mountain/Yuba River study area); 1864--up the Middle Fork Boise River to the Atlanta area, including the Yuba River (adjacent to and south of the Breadwinner, and adjacent to and north of the Steel Mountain/Yuba River study areas). Placer discoveries commonly led to contemporaneous lode discoveries (Wells, 1964, p. 3-54).

Steel Mountain/Yuba River study area

Atlanta district

The Atlanta (Yuba) mining district's major lode properties are located on Atlanta Hill, which is bounded on three sides by the study area (fig. 4). Rich silver (and gold) ores were found in 1864 by placer miners following gold in the gravel of Quartz Gulch, and in a short time most lodes in the district were located. The early production from the Buffalo and Monarch mines was hand sorted, sent by pack train to Rocky Bar, then hauled 370 km (230 mi) by bull team to Kelton, Utah, where it was shipped by railroad to smelters and refiners in Nebraska and New Jersey. Much of this ore netted $700 to $800 in gold and silver per ton; one shipment of 36.7 mt (40.5 tons) yielded over $160,000. The earliest milling of ore

was by arrastras, but in 1866 a mill was constructed along the Boise River to treat lower grade ore from the Monarch. In 1869 the mine suspended operations due to the failure of its mill to effect satisfactory recovery. The district was inactive until 1874, when lessees at the Monarch discovered new bonanza deposits at greater depth. This ushered in a new period of production that lasted until the middle 1880's and included construction of another mill. Besides the Buffalo and Monarch, other early producers include the Pettit (later called Bagdad-Chase and Boise-Rochester), Last Chance, Minerva, Tahoma, Jessie, Benton, Washington, and Leonora (Big Lode) (Anderson, 1939, p. 19-20).

Most of the Atlanta district mine development and production occurred during three periods, late 1860's to mid 1880's, 1902 to 1918, and the largest producing period, 1932 to 1942. At the time of the roadless area investigation, Atlanta Gold Corp. was attempting to usher in another period of production (and development) that could more than double the previous gold output. Recently the company identified two ore bodies on Atlanta Hill that, combined, contain over 31,100 kg (1 million oz) of gold and over 77,750 kg (2.5 million oz) of silver. The East Pit ore body is 7,529,600 t grading 2.98 ppm (0.087 oz/ton) gold and 8.16 ppm (0.238 oz/ton) silver, and the West Pit ore body is 5,624,500 t grading 1.68 ppm (0.049 oz/ton) gold and 3.02 ppm (0.088 oz/ton) silver (Atlanta Gold Corp., 1989 annual report).

The Boise King placer mine on the Middle Fork Boise River is near the northwest edge of the study area (fig. 2). Reports indicate that in the years 1941, 1942, and 1946 this mine processed over 2,000,000 m^3 of gravel, from which approximately 500 kg of gold and 150 kg of silver were recovered. This would indicate the average value to be \$1.45 per m^3 in gold (\$1.90 per yd^3) (\$350 per troy ounce). The operators processed the gravel using a diesel electric 7-½-cubic ft (0.21 m^3) bucket line dredge (Idaho Inspector of Mines, 1942, p. 112).

There are numerous small areas of placer tailings along the Middle Fork Boise River on the down slope side of elevated (commonly over 10 m above the river) alluvial terraces. Little has been written about these placers, but it is presumed some date back to the 1860's. There are two excellent short articles by Stevens (1913 and 1914) in the Engineering and Mining Journals about the 7,000 m (about 4-mi-long) hydraulic flume of the Boise King Co. Besides carrying water to the Boise King Mine, the flume may have supplied water to a few of the terrace placers along the Middle Fork Boise River.

Table 2 summarizes estimates of pre-1900 mine production for the Atlanta mining district reported by Ballard (1928), and Anderson (1943). Table 3 summarizes lode and placer mine production, 1901 to present, from U.S. Bureau of Mines production records. Many of the mine names that appears in the tables below and this history section do not appear on figure 4 due to changes in names and consolidations of small properties into large operations.

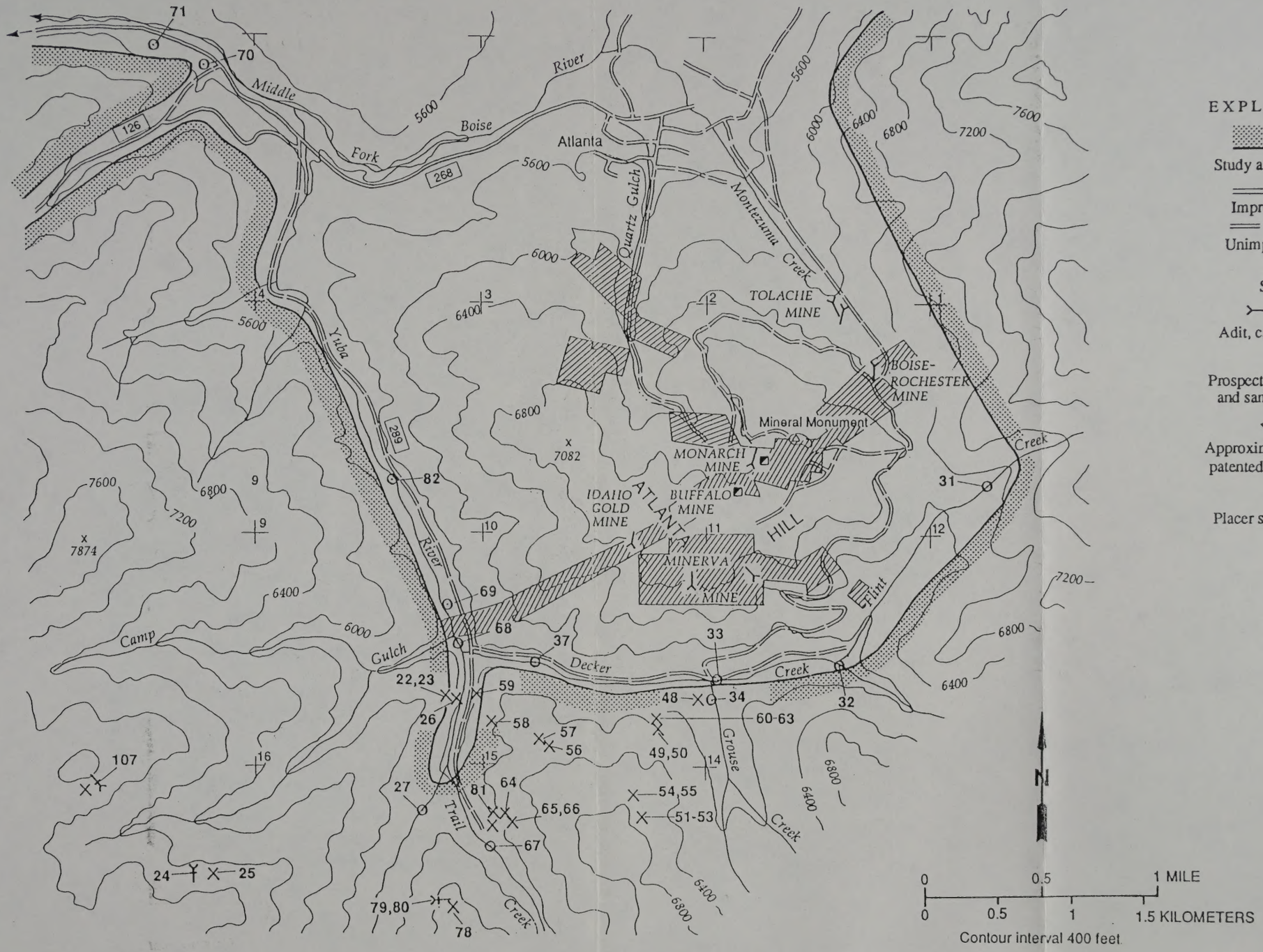

Figure 4.- Mines, prospects, and sample locations in the Atlanta Hill area

Table 2. Summary of Pre-1900 lode mine production, Atlanta (Middle Boise) mining district. (gold prices were $20.67 per oz pre 1934 and $35.00 thereafter)

Mine	Production (historical values)
Ballard (1928)	
Boise-Rochester, General Pettit & Old Chunk	$1,000,000 to 1925 (p. 34)
Monarch group, includes old Buffalo	$1,900,000 (p. 8-10 & 32)
Anderson (1943)	
Boise-Rochester, was Lombard, Stedman, and Old Chunk, later combined as General Pettit	exceeds $2,500,000 to end of 1935, (p. 45-47)
Buffalo	$1,020,000 (p. 58)
Monarch	$1,200,000 (p. 53-55)
estimated total pre-1900 district production	exceeds $2,520,000

Table 3. Summary of lode and placer mine production, Atlanta (Middle Boise) mining district, 1901 to present (USBM production records)

Mine	Ore (ton)	Gold (oz)	Silver (oz)
Lode Mines			
Boise-Rochester, General Pettit, Lombard, Stedtman, & Old Chunk	883,469	247,260.40	1,012,798
Minerva, Monarch, Last Chance, Buffalo, Big Lode, & Hazel Queen	126,131	28,168.77	125,321
Various misc. (over 30 properties)	1,861	1,805.78	9,283
Placer Mines	yd^3		
Boise King and various misc. (over 60 properties)	over 3,000,000	16,769.57	5,643
1901 to present		294,004.52	1,153,045
estimated gold and silver pre-1901		106,000.00	440,000
estimated grand total		400,000.00	1,600,000

Rocky Bar district

The Rocky Bar mining district is just southwest of the Steel Mountain/Yuba River study area (figs. 2 and 5). According to Wells (1964, p. 15), "Rumors of rich South Boise placer possibilities reached the Powder River mines of Auburn, Oregon, by the beginning of April, 1863, and in less than two months, by May 7, the placers had been traced up the Feather River to some still more promising quartz leads in Bear Creek". Anderson (1943, p. 13) stated, "Discovery of the lode deposits at Rocky Bar came in 1863, a year after gold had been found in the stream gravel." The two statements taken together suggest that gold bearing placers along the South Fork Boise River and its tributaries were discovered in 1862, and lode discoveries occurred in 1863. Little is known about activities in the district during the 1860's. Mention is made that in 1869 a few arrastras were operating, three stamp mills were

idle, and there was considerable activity at the Wide West mine. In 1870 the Boneparte mine was the most active operation in the district, but by October 1873 operations were suspended. In 1873 the Ada Elmore mine, owned by the Pittsburg Gold Mining Company, was the leading producer in the camp and also is the leading historical producer. Besides the Ada Elmore, Boneparte, and Wide West, other important past producers include Confederate Star, Idaho Bonanza, Alturas, Ophir Group, Pittsburg, and Vishnu (only those of known location are shown on fig. 5). Lode mines in the Rocky Bar mining district were active from the late 1860's to the early 1890's, reaching peak production between 1875 and 1885 (Anderson, 1943, p. 13-15). Ballard (1928, p. 5) repeats Strahorn's estimate for placer gold production from the Rocky Bar district up to 1881, approximately $2,000,000.

At Spanish Town, inside the Steel Mountain/Yuba River study area (figs. 2 and 5), several mills were built on Elk Creek. Despite the presence of mills, mines at Spanish Town had only a minor production of gold. The mills probably were built to treat ores from the Ophir mine and, possibly, properties in upper Hardscrabble Gulch.

Table 4 summarizes estimates of pre-1900 mine production for the Rocky Bar district from Ballard (1928), and Anderson (1943). Table 5 summarizes lode and placer mine production, 1901 to present, from U.S. Bureau of Mines production records, and estimated pre-1900 production.

Table 4. Summary of Pre-1900 lode mine production, Rocky Bar (Bear Creek) Mining District. (gold price was $20.67 per oz before 1934)

Mine	Production (historical values)
Ada Elmore Lode	$2,500,000 (Ballard, p. 4 & 25; Anderson, p. 14 & 26)
Boneparte	$500,000 (Anderson, p. 15 & 36)
Confederate Star	$350,000 (Ballard, p. 5; Anderson, p. 14 & 28)
Idaho Bonanza and Alturas (Mountain Goat & Empire)	$100,000 (Ballard, p. 5; Anderson, p. 14 & 30-31)
Independence	$50,000 (Anderson, p. 29)
Ophir	$2,250,000 (Ballard, p. 27; Anderson, p. 15 & 31-32)
Pittsburg	$625,000 to $1,250,000 (Ballard, p. 25; Anderson, p. 14)
Vishnu	$850,000 (Ballard, p. 5; Anderson, p. 14 & 27)
Wide West	$1,250,000 (Ballard, p. 5 & 28; Anderson, p. 15 & 37)

Table 5. Summary of lode and placer mine production, Rocky Bar (Bear Creek) mining district, 1901 to present (USBM production records)

Mine	Ore (ton)	Gold (oz)	Silver (oz)
Lode Mines			
Bonoparte (sic), Idaho Consolidated, Opher (sic), Vishnu, West Ophir Group, and Wide West	1,396	726.15	536
Various misc. (over 55 properties)	8,144	2,909.71	2,662
Placer Mines			
South Park Dredging Co. and Various misc. (over 45)	About 7 million yd^3	42,454.43	13,534
1901 to present		46,090.29	16,732
estimated gold and silver pre-1901		525,900.00	413,000
estimated grand total		572,000.00	430,000

Property summary

A detailed (but not complete) chronology of property (or claim) ownership, corporate information, development activity, equipment purchases, employment data, and production statistics can be gleaned from the 1899 to 1974 Idaho Inspector of Mines Annual Report(s), the Mineral Resources of the United States annual reports 1905 to 1951, and The Mines Handbook and Mines Register series 1916 to 1971. Appendix A, tables A-1, A-2, and A-3, list by year and mining district all mines, claims, and companies mentioned in these three serial publications, for the Atlanta and Rocky Bar mining districts. Also, in the Previous Study section of this report table 1 summarize the sources of early descriptions, ownership, and production statistics for the two districts.

A prefield check of the February 12, 1992, BLM claim recordation microfiche disclosed that approximately 520 lode claims and approximately 15 placer claims are located in or partially in the study area. Numerous placer claims along the Middle Fork Boise River, Yuba River, and Decker Creek are adjacent to, but are presumed to be outside the study area.

Breadwinner study area

Little has been written about the history of mining in the vicinity of the Breadwinner study area. USBM production records list 52 placers in the Twin Springs and Boise River mining districts that produced from 1901 to 1951, and which are believed to be adjacent to or in the study area; the records also list 16 placers in the Highland mining district, which extends into the west end of the study area. Nearly all of these mines are believed to have been on the Middle Fork Boise River, with a few on the North Fork of the Boise River. These placers in the Twin Springs and Boise River mining districts produced 62.8 kg (2,019 oz) of gold and 15.8 km (508 oz) of silver, and the placers in the Highland mining district produced 30.3 kg (973 oz) of gold and 4.2 kg (134 oz) of silver.

Numerous areas of placer tailings were seen along the Middle Fork Boise River (fig. 3). The largest area covered by placer disturbances adjacent to the study area is near Twin Springs, at the mouth of Brown Creek. Remnants of a flume that came out of Sheep Creek and crossed the Boise

River can be seen from near sample sites 40 and 41, running to the site of the Glory Hole (an area hydraulically mined). Some other extensive placer tailings are at sample site 36, sample site 20, east and west of sample site 44, and sample site 45. The lack of information found in the literature may be due in part to the area being overshadowed by the very large Boise Basin mining district; Idaho City is only about 11 km north of the Breadwinner study area.

Property summary

Approximately 18 properties believed to be adjacent to or in the study area are mentioned in the 1921 to 1940 Idaho Inspector of Mines Annual Reports (see appendix A, Table A-4). The exact location of most of these properties is not reported in the literature, but about ten properties have names or claim owner's names that appear as geographic names (mostly creek names) on the local topo maps.

BLM claim recordation microfiche disclosed that 77 lode claims and 7 placer claims are located in or partially in the study area. Almost all of the potential placer ground along the Middle Fork Boise River to a point just above Alexander Flats and all of the potential placer ground along the North Fork Boise River to Barber Flats has been withdrawn as parts of the Payette/Boise Reclamation Project in 1904, 1909, and 1910; Boise Reclamation Project in 1928 and 1937; and power site withdrawals in 1930.

MINES, PROSPECTS, AND MINERALIZED AREAS, STEEL MOUNTAIN/YUBA RIVER STUDY AREA

The following pages describe the mines, prospects, and mineralized areas in and adjacent to the Steel Mountain/Yuba River study area. The locations of samples taken at these properties are shown on figures 2, 4, and 5.

EXPLANATION

Study area boundary

Improved road

Unimproved road

Adit,caved adit

X—20 Prospect (short adit, trench or pit) and sample number

Approximate location of patented mining claims

•—87 Float or outcrop sample locality

⊙—14 Placer sample locality

N

0 0.5 1 MILE

0 0.5 1 1.5 KILOMETERS

Contour interval 400 feet

Figure 5.- Mines, prospects, and sample locations in the Spanish Town area

Atlanta Project

LOCATION: S½ sec. 2, S½ sec. 3, E½ sec. 9, secs. 10 and 11, N½ sec. 15, and N½ sec. 14, T. 5 N., R. 11 E., Atlanta Hill (figs. 2 and 4).

ELEVATION: Approximately 1,700 to 2,200 m (5,600 to 7,200 ft)

ACCESS: From Boise, 132 km east by Hwy. 21 and FS Road 268, along Middle Fork Boise River to the town of Atlanta. Atlanta Hill covers 10 to 13 square km immediately south of the town site.

HISTORY: Extraordinarily rich silver-gold ore was discovered in 1864 by placer miners, who traced gold in the gravel of Quartz Creek to its source in the Atlanta lode. The Buffalo and Monarch mines were early major producers. The ore was so rich it could be hand sorted to yield $700 to $800 in gold and silver per ton (at historic metal prices); one shipment of 36.7 tonne yielded over $160,000. Other early producers include Pettit (later Bagdad-Chase and Boise-Rochester), Last Chance, Minerva, Tahoma, Jessie, Benton, Washington, and Leonora (Big Lode). Most of these later were consolidated into larger mines.

Most of the Atlanta district's mine development and production occurred during three periods: late 1860's to early 1880's, 1902 to 1918, and the largest producing period, 1932 to 1942. At the time of the roadless area investigation, Atlanta Gold Corp. was attempting to usher in another period of production (and development) that could more than double the previous gold output.

In 1940, a staff metallurgist at the Talache Mines' mill observed a steak of white mineral on one of the shaker tables, which turned out to be scheelite (a tungsten mineral). An investigation revealed that scheelite-bearing material was coming from the western part of the mine, the Buffalo-Monarch workings. Alterations to the mill allowed Talache Mines to produce, from the first of April 1942 to the end of January 1943, 113.6 tonne of concentrates containing 12,995 kg of WO_3 (from unpublished USBM War Minerals Report). It was reported in 1941 by Joe H. Skidmore, General Superintendent, Talache Mines, Inc. (Mining Congress Journal, April, 1941, vol. 27, #4, p. 72-77) that, "One stope, although relatively small, proved to have more value in tungsten than the gold and silver ..."

PRODUCTION: Tables 2 and 3 summarize gold and silver production from the district; some USBM individual mine production data are proprietary. Mines in the district also produced about 13,000 kg of WO_3 contained in tungsten concentrates, and some copper, lead, and zinc.

GEOLOGY: Anderson (1939, p. 1) stated, "... deposits lie along a zone that extends through the Idaho batholith in a northeasterly direction. They occupy prominent shear and fracture zones apparently produced by horizontal shearing stress. The principal fracture zone is occupied by the Atlanta lode, the largest and most productive in the district; the others are of smaller size and extend west-northwest at angles oblique to the main lode. The Atlanta lode has been traced for more than 2 mi and is from 40 to 120 ft wide, but the ore appears to be confined to shoots of exceptional porosity determined by variations in the strike of lode itself. It contains six main shoots from 200 to 800 ft long, from about 400 to 800 ft high, and ranging from 4 to 6 ft - locally as much as 30 ft thick."

Worl's and Johnson's (work in progress) cataloging of deposit types found in the Hailey Quadrangle classifies the Atlanta deposits as polymetallic quartz veins and lodes, also known as mixed base- and precious-metal

veins. This type of mineralization in the Idaho batholith formed during and directly following formation of the batholith, in fractures resulting from the cooling process. Regionally, this is a period when the tectonic setting was changing to a dominantly tensional structural environment.

Deposits in the Atlanta district contain multistage vein quartz, sericite, and metal-bearing sulfides. Fine-grained quartz fills fractures and replaces material that has been sheared and brecciated, and late stage comb quartz fills fracture openings. Mineralized material contains arsenopyrite, pyrite, and minor sulfides of silver, galena, zinc, copper, antimony, and molybdenum, and minor scheelite.

WORKINGS: There are numerous underground workings, most caved, with thousands of meters of development and stopes. Also, there are numerous prospect pits and trenches, and drill sites.

SAMPLES: No USBM lode samples were taken for this study. Reconnaissance placer samples were taken to check heavy minerals.

CONCLUSIONS: By the spring of 1986, Atlanta Gold Corp. had delineated two ore bodies on Atlanta Hill; the East Pit ore body containing 7,529,600 tonne grading 2.98 ppm (0.087 oz/ton) gold and 8.16 ppm (0.238 oz/ton) silver; and the West Pit ore body containing 5,624,500 tonne grading 1.68 ppm (0.049 oz/ton) gold and 3.02 ppm (0.088 oz/ton) silver. Recent exploration to expand reserves also has revealed deep, high-grade resources that may be minable by underground methods (Lance Bacon and Frank Hingley, Atlanta Gold Corp., oral commun.).

Grouse Creek Claim Group Area

LOCATION: S½ sec. 15 and N½ sec. 22, T. 5 N., R. 11 E., on hill between Grouse and Trail Creeks, just south of Atlanta Hill (fig. 4; sample locations 48-58, and 60-63).

ELEVATION: Approximately 1,700 to 2,160 m (5,600 to 7,060 ft)

ACCESS: East from Boise, 129 km by Hwy. 21 and FS Road 268 along Middle Fork Boise River, and finally about 3 km south on gravel road along Yuba River.

HISTORY: The claim group covers the area that Anderson (1939, pg. 69-70) described as the Pal group and Constant Hope properties. He reported that in 1936 the Pal group was treating ore at a 3-ton mill and had developed about 44 m of crosscut and drifts in one tunnel. Records show that in 1936-37, the Pal group was owned by S. L. and May Robbins. Sample site 48 probably is the location of this adit. For the Constant Hope property Anderson described a half-dozen caved cuts and tunnels (adits) that dotted the slope towards the juncture of the Yuba River and Decker Creek. Presently, the claim block is owned by Harold Greenwald.

GEOLOGY: Old workings and the owner's recent exploration exposed zones of sheared, altered, and mineralized Idaho batholith rocks that contain fine-grained quartz, comb and vuggy quartz, sericite, oxidized sulfides, arsenopyrite, and pyrite. At sample site 48, Anderson (1939) described a zone of shearing as much as 8 m thick, striking approximately N. 60° E., and dipping about 60° SE. Where sample 48 was taken, the estimated trend of the shear was N. 65° E., and Kiilsgaard's and Stewart's (work in progress) geologic map of the Atlanta area shows the Flint Creek Fault with a similar trend crossing this sample site. Sample sites 49, 50, and 60-63 suggest more trends east-west, while sample sites 51-55 suggest a NW trend, similar to a vein Kiilsgaard and Stewart mapped at this location.

WORKINGS: Mine and prospect workings consist of recent dozer cuts in the area of sample sites 48-55, a 33.5-m-long adit at sample localities 60-63, a short caved adit at sample site 48, and three old prospect pits at sample sites 56-58.

SAMPLING: Fifteen samples were taken (appendix B, table B-1, samples 48-58, and 60-63). Ten were select samples and five were chip samples. The more notable samples are described below.

In the area of recent dozer trenching, an 0.8-m-long chip sample at the caved adit (48) assayed 2,705 ppb (0.079 oz/ton) gold. Two chip samples in a dozer trench assayed 3,830 ppb (0.112 oz/ton) gold and 39 ppm (1.14 oz/ton) silver over a 3.4-m length, and 12,330 ppb (0.360 oz/ton) gold and 33 ppm (0.96 oz/ton) silver over a 1-m length (samples 51 and 53, respectively). Also in the area of recent dozer cuts five select samples assayed from 105 ppb to 3,245 ppb (0.095 oz/ton) gold, and 0.2 ppm to 160 ppm (10.50 oz/ton) silver, and averaged 1,263 ppb (0.037 oz/ton) gold, and 38 ppm (1.11 oz/ton) silver. Atlanta Gold Corp. took twenty chip samples, most at 3 m intervals, along the recent dozer trenches. One 6.1-m interval averaged 1,340 ppb (0.039 oz/ton) gold, and a 15.2-m interval averaged 650 ppb (0.019 oz/ton) gold; only two samples assayed under 100 ppb gold. The company's short report to Harold Greenwald, the claim block owner, also mentioned a narrow (0.61 to 1.83 m) high-grade center assaying 0.1 to 3 oz gold per ton (3,429 to 102,857 ppb).

Select samples (56-58) were taken at three old prospect pits on the west side of the property. They returned assays of 250 ppb, 225 ppb and 5,020

ppb (0.147 oz/ton) gold, respectively; one (57) also assayed 38 ppm (1.11 oz/ton) silver.

Two chip and two select samples (60-63) were taken from a 33.5-m-long adit. They assayed 90 ppb to 1,030 ppb (0.030 oz/ton) gold.

Of the fifteen samples taken from the Grouse Creek claim group, five assayed 1,850 to 11,000 ppm arsenic, and eight assayed 115 to 985 ppm arsenic.

CONCLUSIONS: Work by the claim owner has exposed some large areas of alteration and mineralization. Chip sample 48 (2,705 ppb gold), and the adit at sample sites 60-63 (90 to 1,030 ppb gold), are on the northeast trending structure Kiilsgaard and Stewart mapped as the Flint Creek Fault, while at the Lead Nickel property, samples 64-66 and 81 (265 to 98,500 ppb gold), the mineralized structure strikes N. 70° to 75° E.; this may mean mineralized material can be found in a large northeast trending structure, approaching more than 1,800 m in length. Strong mineralization also can be found in structures with other orientations. The alteration, mineralization, and high gold assays associated with high arsenic assays are features similar to those found at the nearby Atlanta lode. Mineralization in a possibly large structure, and similarities to that highly productive lode, are factors that raise the probability a significant gold resource may be found.

Yuba Group

LOCATION: SE¼ sec. 16, T. 5 N., R. 11 E., on both sides of the Yuba River less than 0.4 km above the confluence with Decker Creek (fig. 4, sample locations 22, 23, 26, and 59).

ELEVATION: 1,670 to 1,770 m

ACCESS: From Boise, 129 km east by way of Hwy. 21 and FS Road 268 along the Middle Fork Boise River, then approximately 5.6 km south along the Yuba River and Trail Creek.

HISTORY: Anderson (1939) mentioned the property was extensively prospected in the early days, and that only one adit on the east side of the Yuba River was partially open for about 45 m in the summer of 1936. At the time of roadless area study the property was covered by the Kristin, or Golden Stinger, or Partner claim groups.

PRODUCTION: USBM production records show the Golden Stinger mine had intermittent production from 1945 to 1978. F. M. Harsin and E. T. Seaton of Atlanta were the owners/operators.

GEOLOGY: Dumps at caved workings indicate altered Idaho batholith rocks, as well as mineralized material, were being encountered underground. The material contained sericite, argillite, fine-grained quartz replacing the country rock, quartz veinlets, crystalline-quartz space filling, pyrite, arsenopyrite, and oxides of iron and arsenic. Slopes are overgrown and covered with talus, but the alignment of the workings suggest an east-west trend. Kiilsgaard's and Stewart's map shows an east-west fault though this area that may be a splay of the Flint Creek Fault.

WORKINGS: Five caved adits, four on the west side and one on the east side of the Yuba River. Lengths are estimated to be 20 to over 70 meters.

SAMPLING: Four samples were taken (appendix C, table C-1, samples 22, 23, 26 and 59) -- three select and one grab sample. Samples 22 and 23 were from two closely spaced, caved adits; 22, a select sample, assayed 2,145 ppb (0.063 oz/ton) gold and 6,750 ppm arsenic; 23, a grab of an adit dump, assayed 3,410 ppb (0.100 oz/ton) gold and 1,840 ppm arsenic. Sample 26, a select sample, was taken from two other closely spaced, caved adits, and assayed 1,320 ppb (0.039 oz/ton) gold and 31,000 ppm arsenic.

CONCLUSIONS: Mineralization and alteration are similar to that seen in the nearby productive Atlanta lode. These features indicate the property possibly contains a gold resource.

Lead Nickel

LOCATION: W½, NW¼ sec. 22, T. 5 N., R. 11 E. (fig. 4, sample locations 64-66, and 81), at the end of Trail Creek road.

ELEVATION: 1,730 to 1,890 m

ACCESS: From Boise, 129 km east by way of Hwy. 21 and FS Road 268 along the Middle Fork Boise River, then approximately 5.6 km south along the Yuba River and Trail Creek.

HISTORY: Dave Haskins, present claim owner, reports that the property was first worked in the 1940's.

PRODUCTION: No production recorded, but a small mill is on the property; it was most likely built in the 1940's.

GEOLOGY: The workings are in altered and mineralized rocks of the Idaho batholith, in a northeast-trending structure. The material contains fine-grain quartz replacing country rock, quartz veinlets, crystalline-quartz space filling, sericite, argillite, pyrite, arsenopyrite, and oxides of iron and arsenic. A structure strikes N. 70° to 75° E., and dips 45° NW at sample site 66.

WORKINGS: Five caved adits, with estimated lengths ranging from 15 to over 45 m.

SAMPLING: One chip, one random grab, and two select samples were taken (appendix C, table C-1, samples 64-66, and 81). A chip sample (66) of a 0.5-m width of mineralized outcrop contained 32,950 ppb (0.962 oz/ton) gold and 4,205 ppm arsenic. A grab sample (64) of altered country rock assayed 265 ppb gold and 238 ppm arsenic. The two select samples (65 and 81) of mineralized material contained 98,500 ppb and 2,675 ppb (2.88 oz/ton and 0.078 oz/ton, respectively) gold, and 26,000 ppm and 6,080 ppm arsenic; also one (65) contained 8.1 ppm (0.24 oz/ton) silver.

CONCLUSIONS: The structure at sample site 66 suggests mineralization may be on an unmapped continuation of Kiilsgaard's and Stewart's Flint Creek Fault, which on the Grouse Creek claim group was found to be mineralized along approximately 1,800 m to the northeast. The high arsenic assays associated with high gold assays, and alteration assemblage are features similar to those found at the nearby Atlanta lode. A potentially large structure containing mineralization and similarities to that lode are factors that raise the probability that a gold resource may be found on the property. However, surface exposure of mineralization is narrow.

Miscellaneous Prospects Between the Yuba River and Trail Creek

LOCATION: NE¼, SE¼ sec. 21, T. 5 N., R. 11 E., on ridge between Yuba River and Trail Creek (fig. 4, sample locations 78-80).

ELEVATION: 1,920 to 2,020 m

ACCESS: From Boise, 129 km to the east by Hwy. 21 and FS Road 268, then approximately 5.6 km south along the Yuba River and Trail Creek, and finally about 0.5 km overland.

HISTORY: Nothing appears in the literature about this property. The adit dump at sample sites 79 and 80 has a large steam boiler on it.

PRODUCTION: No record of production from the property.

GEOLOGY: The dump at a short caved adit, and surface prospects indicate altered Idaho batholith rocks containing mineralized material was being encountered. The material contains sericite, argillite, fine-grain quartz replacing country rock, quartz veinlets, crystalline-quartz space filling, pyrite, arsenopyrite, and oxides of iron and arsenic. Sample 79 was taken from a zone of altered, fractured, and sheared rocks that strikes N. 50° W. and dips 45° to 50° NE.

WORKINGS: Several prospect pits on the ridge top, a caved adit over 60 m long below and west of the pits, and below the adit a 30-m-dozer cut.

SAMPLING: One chip and two select samples were taken (appendix C, table C-1, samples 78-80). A 2.4 m chip sample (79) of altered and mineralized material from just above the caved adit assayed 3,875 ppb (0.113 oz/ton) gold and 530 ppm arsenic. A select sample (80) taken at the adit assayed 13,480 ppb (0.394 oz/ton) gold, 5.3 ppm (0.15 oz/ton) silver and 3,305 ppm arsenic. Another select sample (78) of altered material from the ridge top assayed 130 ppb gold and 238 ppm arsenic.

CONCLUSIONS: Mineralization and alteration are similar to that seen in the nearby productive Atlanta lode. These features indicate the property possibly contains a significant gold resource.

Camp Gulch Area

LOCATION: S½ sec. 17 and S½ NE¼ sec. 20, T. 5 N., R. 11 E. (fig. 4, sample localities 24, 25, and 107), between Camp Gulch and the Yuba River.

ELEVATION: 1,950 to 2,260 m

ACCESS: From Boise, 129 km east by way of Hwy. 21 and FS Road 268, then approximately 5 km south along the Yuba River, and finally about 2.4 km across rugged terrain (by foot) to the west-southwest.

HISTORY: Nothing appears in the literature about this property. There is a large steam boiler on the waste dump at sample locality 24.

PRODUCTION: No record of production from the property.

GEOLOGY: Dumps at caved workings and surface prospects indicate altered Idaho batholith rocks containing mineralized material was being encountered. Altered and mineralized material contains sericite, argillite, fine-grained quartz replacing country rock, quartz veinlets, crystalline-quartz space filling, pyrite, and oxides of iron. At sample site 24, a mineralized structure over 9 m wide was found to strike N. 80° E. and dip 75° to 80° SE. Kiilsgaard's and Stewart's map shows an east-northeast trending quartz vein at sample site 24, but shows a dip to the NW. of 60°.

WORKINGS: A caved adit, about 8 m, and two adjacent prospect pits are at sample site 107; another caved adit, over 30 m, and two areas bulldozed and benched are at sample sites 24-25.

SAMPLING: Three samples, one chip and two select, were taken (appendix C, table C-1, samples 24, 25, and 107). A chip sample (24) of a 0.9-m-wide mineralized structure assayed 2,105 ppb (0.061 oz/ton) gold and 158 ppm arsenic; a select sample (107) of mineralized material assayed 14,850 ppb (0.434 oz/ton) gold, 9.1 ppm (0.27 oz/ton) silver and 135 ppm arsenic; and a select sample (25) of altered material assayed 285 ppb gold.

CONCLUSIONS: Mineralization, arsenic assays, and alteration are similar to those seen in the nearby productive Atlanta lode. These factors raise the probability the property contains a gold resource. However, the structure is only about 1 meter wide.

Little Queens Mine Tungsten Deposit (XYZ Claims)

LOCATION: E½ sec. 29, T. 5 N., R. 11 E. (fig. 2, sample localities 28 and 29), on the west side of the Yuba River.

ELEVATION: 1,890 to 1,980 m

ACCESS: From Boise, 129 km to the east by Hwy. 21 and FS Road 268, then approximately 4.8 km south along the Yuba River, and finally by foot 2.4 to 4.8 km along the Yuba River and up slope to the west.

HISTORY: This property was examined for tungsten by a USBM engineer and a USGS geologist in October, 1952, as part of the Defense Minerals Administration (DMA) program. The subsequent unpublished report was the source for this history section. Mr. E. T. Seaton of Atlanta, Idaho, made the discovery in 1951 and staked the XYZ #1 through #3 claims. Several shallow pits were dug on the vein and a 42-m crosscut was driven by hand. Mr. Seaton leased the claims to Little Queens Mines, Inc.

PRODUCTION: No production reported.

GEOLOGY: In 1952, the deposit (sample localities 28 and 29) was reported to be a "fairly strong, irregular quartz vein in granite", that strikes N. 75° E. and is nearly vertical. Scheelite sporadically occurs in the vein. The roadless area study found extensive altered Idaho batholith rocks, with quartz veinlets, sericite, epidote, chlorite, and iron oxide psuedomorphs after pyrite. Nearby (sample localities 104 and 105) quartz pods, up to 4.6 by 15.2 m and striking approximately N. 70° W., also were examined.

WORKINGS: Four surface cuts and a 42-m-long adit were found on the property during the 1952 examination. During the 1992 examination, the discovery cut and a caved adit were found.

SAMPLING: Of the samples taken in 1952, one labeled R-12 represented a 0.6-to 0.9-m width of "good ore" that assayed 2.40% WO_3, R-10 represented "fair ore on dump" that assayed 0.17% WO_3, and R-11 represented a 0.9-to 1.2-m width of "low grade" that assayed 0.08% WO_3. The remaining two samples taken in 1952 were barren. During the 1992 examination, four samples were taken, one chip, one grab and two select samples (appendix C, table C-1, samples 28, 29, 104, and 105). A select sample (28) at the caved adit and a 1.1-m chip sample (29) at the discovery pit contained 205 ppb and 72 ppb gold, and 335 ppm and 108 ppm arsenic, respectively, but no tungsten was detected. A grab sample (104) and a select sample (105) of the nearby large quartz pod assayed 28 ppb and 75 ppb gold, respectively.

CONCLUSIONS: Elevated gold and arsenic assays in quartz veins and altered country rock, east-northeast striking veins, and spotty tungsten values are features similar to the nearby productive Atlanta lode. These similarities raise the probability of a gold resource existing on the property. However, during the 1992 investigation, no ore grade material was encountered and mineralization wider than 1-m vein widths would be required to delineate a moderate tonnage.

Samples From East Side Of Study Area

LOCATION: Unsurveyed - NE¼ sec. 7, NW¼ sec. 8, SE¼ sec.17, and NW¼ sec. 21, T. 5 N., R. 12 E. (fig. 2, sample localities 95-98, 108, and 109), along the east border of the roadless area.

ELEVATION: 2,530 to 2,930 m

ACCESS: From Boise, approximately 137 km east by way of Hwy. 21 and FS Road 268 to the mouth of Grays Creek, then by foot 3.2 km south to the first sample site. The remainder of the sample sites are within 4 km to the south.

HISTORY: None.

PRODUCTION: No evidence of production.

GEOLOGY: On the east side of the study area altered batholith rocks were noted at several different localities. The material contains sericite, fine-grained quartz replacing country rock, veinlets to massive quartz, and oxides of iron and arsenic (?) indicating the presence of pyrite and arsenopyrite. At sample sites 97-98, veins and veinlets of quartz strike N. 45° to 83° E. and dip from 74° SE. to vertical to slightly overturned.

WORKINGS: None.

SAMPLING: Six samples, one chip and five select, were taken (appendix C, table C-1, samples 95-98, 108, and 109). A select sample (108) assayed 370 ppb gold, 4,150 ppm arsenic, and 142 ppm zinc; and another select sample (109) assayed 135 ppb gold and 162 ppm arsenic. A select sample (95) taken at the headwaters of Grays Creek assayed 560 ppm lead, 230 ppm zinc, and 116 ppm arsenic.

CONCLUSIONS: Anomalous gold and arsenic assays, and type of alteration are features similar to those seen at the nearby productive Atlanta lode. These features may encourage exploration, but samples were not ore grade, and the rock alteration was not extensive.

Upper Decker Creek

LOCATION: NW¼, NW¼ sec. 33, T. 5 N., R. 12 E. (fig. 2, sample localities 93-94, and 106), in the southeast corner of the study area.

ELEVATION: 2,370 to 2,430 m

ACCESS: From Boise, 129 km east by way of Hwy. 21 and FS Road 268, then approximately 6.4 km on jeep trails along the Yuba River and Decker Creek, and approximately 8 km along a trail up Decker Creek.

HISTORY: Nothing found in the literature about these workings.

PRODUCTION: None recorded.

GEOLOGY: Adits had been excavated in altered and mineralized batholith rocks in a northeast-trending structure. The material contains vein quartz, chlorite, sericite, pyrite, galena, sphalerite, and iron oxides. At sample site 93, the mineralized structure strikes N. 20° to 10° E., dips 55° NW. At the adit where sample 106 was taken, the only alteration seen on the dump was some relatively fresh-looking granitic rock with disseminated iron oxide psuedomorphs after pyrite. This adit appears to have been an attempt to undercut the mineralized structure found at sample sites 93-94.

WORKINGS: Two caved adits estimated to be 45 to 90 m in length.

SAMPLING: One chip and two select samples were taken (appendix C, table C-1, samples 93-94, and 106). A 0.6-m-long chip sample (93) of the mineralized structure assayed 0.38% lead, 0.30% zinc, 395 ppb gold, 11 ppm silver, and 50 ppm tungsten; a select sample (94) of mineralized material assayed 0.96% lead, 1.8% zinc, 1,440 ppb (0.042 oz/t) gold, 86 ppm (2.5 oz/t) silver, and 295 ppm tungsten; and a select sample (106) of relatively fresh-looking granitic rock with disseminated iron oxide psuedomorphs after pyrite assayed 210 ppb gold and 7.3 ppm silver.

CONCLUSIONS: All three samples taken at this property contain anomalous gold and silver, but unlike most samples from the other properties in the Steel Mountain/Yuba River study area that are similar to the gold-silver bearing Atlanta lode, contain little arsenic (from 13 to 22 ppm). Also, not seen at most other properties are high base metal and tungsten assays. The mineralization appears to be a gold-bearing, polymetallic quartz vein type (Cox and Singer, 1986, p. 125-129), and sample 106 would indicate low grade mineralization may extend into altered wall rock. There is a good probability that a resource could be delineated at this property, but the narrow surface exposure of mineralization indicates the tonnage would most likely be small.

Spanish Town

LOCATION: SW¼ and W½, SE¼, sec. 3, T. 4 N., R. 10 E. (fig. 5, sample localities 16-20, and 38-46), in the southeast corner of the roadless unit.

ELEVATION: 1,640 to 1,890 m

ACCESS: From Featherville, about 12.8 km north on FS Road 126 (to just north of Rocky Bar), and then jeep trail up locally named Blake's gulch 5.6 km to ridge top overlooking Elk Creek in the Spanish Town area.

HISTORY: Spanish Town, which is inside the Yuba River unit of the study area, is an enigma. Earlier writers, and ruins seen during field study, indicate arrastras, stamp, and chilean mills had operated there in the past, but the mine and prospect workings seen do not seem extensive enough to have supplied ore to several generations of mills. According to Anderson (1943, p. 34), "The camp was active in the early days but there seems to be no available record of the early development and production nor of the work done from time to time since. The last (major exploration and development) work was in 1937 and 1938 by the Elk Creek Spanish Town Mines, Inc.; but after rehabilitating some the old tunnels and placering some of the hillside wash, the company suspended operations for financial reasons. The most extensive workings are ... on the west side of Elk Creek and include a 500-ft adit at creek level and a 390 ft adit on the slope high above the creek. There are also some workings of lesser extent on the other (east) side of the creek. Much of the late work was confined to placering the slope near these workings on the east side of the creek."

Ballard (1928, p. 26 and 27) reported fifteen years earlier, "The principal (Spanish Town) workings are confined to one quartz vein averaging from 2 to 2½ ft in width, best shown in the 500-ft drift extending southwesterly into the hill at creek level ... There are several chutes leading to stopes overhead in this adit drift. According to report, much of the ore assayed over $50, in gold per ton but less than 10 percent was saved by amalgamation. No explanation was given for this. There is no record given of former production. The great difference between the reported value of the ore, and the recovery, may be due to faulty sampling. The several samples taken by the writer would bear this out. There is reliable information to the effect that there was a good grade of free milling ore at this mine throughout the upper levels of the old workings. In the early days, it was worked by arrastras, remains of which are yet on the ground. Later a 5-stamp mill was built ... but results were not satisfactory. One is impressed with the sight of the several pieces of heavy machinery to be seen here, and knowing that these were hauled into the country from Rocky Bar over a road which could hardly be called such except by a considerable stretch of the imagination, one must admire the pluck and persistence of the freighters who succeeded in bringing this heavy equipment into camp. The Spanish Town vein is reported, by those familiar with the country to mark, locally, the northern limit of any significant gold veins. The vein has been traced southwesterly to an adjoining property where it becomes known as the North Ophir. The owners of the North Ophir likewise claim that vein there marks the northern limit of the gold belt. Old placer diggings by their location seem to confirm this statement."

Robert Romig, as a youth, had worked in the mines of Spanish Town with his father; he received his masters degree in history at Berkeley and wrote his thesis about "The South Boise Quartz Mines, 1863-1892 - A Study in Western Mining Industry and Finance"; and presently (1992) owns a claim group that covers most of the Spanish Town area. Mr. Romig related

to us that his experience at Spanish Town and the relatively small size of dumps seen at the caved underground workings suggest they were exploring and developing mineralized structures, and that little ore was actually produced for the mills on Elk Creek. He believes operators of the Ophir Mine and other mines in upper Hardscrabble Gulch found it easier to haul ore to mills at Spanish Town where water was plentiful throughout the summer, than to the next closest source of abundant water, Bear Creek at Rocky Bar.

PRODUCTION: In 1910, L. A. Berdon of Rocky Bar produced gold and silver from a placer operation at Spanish Flats (Spanish Town).

GEOLOGY: Dumps at caved workings, and some outcrops on the east side of Elk Creek, indicate extensive altered batholith rocks and mineralized material were encountered. The altered and mineralized material contains sericite, fine-grain quartz replacing country rock, quartz veinlets, crystalline-quartz space filling, pyrite, arsenopyrite, oxides of iron and arsenic, and minor chlorite and epidote. On the east side of Elk Creek, a shear zone strikes N. 10° to 35° E. and dips 24° to 38° SE. (sample site 18), and another zone trends N. 45° E. (sample site 38). On the west side of Elk Creek, three orientations of shearing and quartz veining at a prospect (sample sites 40, 41, and 43) gave strikes ranging from N. 65° to 80° E., and dips ranging from 76° SE. to 85° NW.

WORKINGS: On the ridge top west of Elk Creek (sample site 44) are several small pits and trenches; on a slope west of Elk Creek is a partially open (60 m) adit (sample sites 40, 41, and 43), reported to be about 140 m (Robert Romig, personal commun.) long, and a caved adit (sample site 42) reported to be over 120 m long; and east of Elk Creek two caved adit portals that reportedly lead to approximately 75 m of underground workings, a new adit being dug by Mr. Romig (sample sites 16 and 17), and two prospect pits (sample sites 18-20).

SAMPLING: Fourteen samples, nine select, four chip and one grab, were taken (appendix C, table C-1, samples 16 to 20, and 38 to 46). A chip sample (40) of a 0.3-m zone of mineralized quartz veinlets and silicification assayed 11,680 ppb (0.341 oz/ton) gold and 4.6 ppm (0.13 oz/ton) silver. A select sample (16) of mineralized material at the adit under excavation assayed 8,305 ppb (0.243 oz/ton) gold, 4.6 ppm (0.13 oz/ton) silver, 1,960 ppm lead, and 5,510 ppm arsenic. Of the remaining twelve samples, 9 were anomalous, assaying 203 to 3,090 ppb (0.006 to 0.090 oz/ton) gold. Ten assayed 112 to 5,520 ppm arsenic.

CONCLUSIONS: Mineralization and alteration, fairly easy to find in the Spanish Town area, are similar to that seen in the nearby productive Atlanta lode. These features indicate the property possibly contains a significant gold resource. However, finding a moderate to large tonnage would require delineating zones of mineralization much wider than the 0.3 to 0.9 m found.

RDO Claim Group

LOCATION: secs. 24, 25, 26, 35, and 36, T. 5 N., R. 10 E.; and secs. 19, 30, and 31, T. 5 N., R. 11 E. (fig. 5, sample localities 87-91, and 103), on, and southeast of Bald Mountain, the highest point in the Yuba River unit of the study area.

ELEVATION: 2,250 to 2,855 m

ACCESS: From Boise, approximately 129 km east by way of Hwy. 21 and FS Road 268, then over 8 km southwest on FS Road 126, and finally hike 1.6 km to top of Bald Mountain ridge.

HISTORY: According to BLM claim recordation records, Robert Lazovich of Reno, Nevada, staked the claim group in 1988 and 1989. However, a prospect symbol is shown as being on the ridge top 1.6 km southeast of Bald Mountain, on the 1964 publication of the Cayuse Point 7.5-minute USGS quadrangle.

PRODUCTION: No indication of production.

GEOLOGY: In the area of sample localities 87-91, an over 300-m-wide zone of altered batholith rocks crosses the ridge top. Altered material contains sericite, quartz veinlets, white vein quartz, iron oxides and psuedomorphs after pyrite, arsenic oxides, and minor fresh pyrite. A vein in this area strikes N. 75° to 80° E. and dips near vertical, and a dark green dike strikes N. 20° E. to due north and dips near vertical. At sample locality 103, on Bald Mountain, are small pegmatite dikes and altered wall rock.

WORKINGS: Several prospect pits along the ridge top.

SAMPLING: Six samples, one chip, two grab, and three select were taken (appendix C, table C-1, samples 87-91, and 103). One select sample (88) assayed 247 ppb gold; a grab sample (87) assayed 3,350 ppm arsenic; three samples (89-91) assayed 172 to 325 ppm arsenic; and a chip sample (90) assayed 87 ppm (2.5 oz/ton) silver, 740 ppm lead, 104 ppm zinc, 325 ppm arsenic, 75 ppm tungsten, 285 ppm bismuth, and 1,035 ppb mercury.

CONCLUSIONS: Anomalous gold and arsenic assays, and type of alteration found in the Bald Mountain area, are features similar to those seen at the nearby Atlanta lode. These features will encourage exploration, but ore grade assays will have to be encountered before this part of the study area has a likelihood for a significant gold resource. Sample 90, unlike most lode samples taken in the study area, also contained anomalous base metals (lead and zinc), silver, tungsten, and bismuth. This single sample suggests the possibility of a different deposit model -- a gold-bearing, polymetallic quartz vein type (Cox and Singer, 1986, p. 125-129).

RST Claim Group

LOCATION: Most of S½ of T. 5 N., R. 10 E. (fig. 5, sample localities 84-86, and 101-102), straddling the corridor between the Steel Mountain and Yuba River roadless areas.

ELEVATION: 1,820 to 2,750 m

ACCESS: From Boise, approximately 129 km east by way of Hwy. 21 and FS Road 268 and then just over 8 km to the southwest on FS Road 126, where the road starts to cross the claim block.

HISTORY: BLM claim records indicate the RST claim group was located in 1988.

PRODUCTION: No indication of production.

GEOLOGY: Areas that appeared to be altered batholith rocks were examined and sampled. One area (sample site 86) was underlain by altered material containing sericite, oxides of iron and psuedomorphs after pyrite, minor veinlet quartz, and minor fresh pyrite. Two areas (sample sites 84 and 85) were stained by iron oxides and contained some chlorite. One sample (102) from nearby was of a Tertiary-age fine grain granite dike with iron oxide psuedomorphs after pyrite. Another sample (101) was of a pegmatite dike and altered wall rock.

WORKINGS: According to Mr. Dean Rogers, one of the owners of the claim group, five exploration holes have been drilled on the property (along FS Road 126). No other prospect workings were seen.

SAMPLING: Five samples were taken (appendix C, table C-1, samples 84-86, 101-102). One sample (86) assayed 185 ppb gold and 110 ppm arsenic. Mr. Rogers reported that mineralized material in one exploration drill hole assayed 0.468, 0.156, 0.016, and 0.014 oz/ton gold at four intervals; he also reported the other drill holes encountered similar mineralized material. No data was given to USBM to substantiate this.

CONCLUSIONS: One altered area (sample site 86) had anomalous gold and arsenic assays, and alteration similar to that at the nearby Atlanta lode. These features will encourage further exploration.

Cayuse Point-Pony Ridge Area

LOCATION: SE¼ sec. 1, sec. 12, and sec. 13, T. 4 N., R. 10 E.; and sec. 6, and NW¼ sec. 7, T. 4 N., R. 11 E. (fig. 2, sample localities 4-8 and 92), along Pony Ridge to Cayuse Point.

ELEVATION: 2,010 to 2,720 m

ACCESS: From Featherville, just 7.2 km northeast by way of FS Road 135 up Cayuse Creek, then 1.6 km north on a jeep trail, and then by foot about 3.2 km along Pony Ridge to the Cayuse Point area.

HISTORY: BLM records show the claims were originally located in 1962, and owned by Donnelly O'Neill of Portland, Oregon, and Kenneth Evertt (no address).

PRODUCTION: No evidence of production.

GEOLOGY: Scattered zones of altered batholith rocks containing sericite, quartz veinlets, and oxides of iron and psuedomorphs after pyrite. One sample (8) was of pegmatite and altered wall rock.

WORKINGS: Several small prospect pits and trenches were found on the ridge (sample localities 7 and 8).

SAMPLING: Six samples, one grab and five select, were taken (appendix C, table C-1, samples 4-8, and 92). No economically significant metal concentrations were detected.

CONCLUSIONS: Alteration in this area may attract exploration.

Placers

Thirty-three placer samples (appendix C, table C-2, figs. 2, 4, and 5) were taken adjacent to or in the Steel Mountain/Yuba River study area, mainly from along the Middle Fork Boise River, Decker Creek, Yuba River, and Elk Creek. Samples from areas not claimed in 1992 were taken of small gravel bars or benches close to the active stream channels, and were taken to test for the presence of gold from streams draining the interior of the study area. Of the twenty samples from claimed areas, fourteen were from gravel bars and benches close to active stream channels, and six were from elevated alluvial terraces (most over 9 m above the stream). Of these terraces, four were along the Middle Fork Boise River, one on Elk Creek, and one on Grouse Creek.

Following are summaries of the more important placers in the claimed areas, most of which are adjacent to the study area. The estimated gold-bearing gravel volumes mentioned below are speculative; the single sample from each of the placers is only indicative of what may be found. A gold value of $350 per ounce is used to calculate equivalent gold value per m^3 (and yd^3).

Sample Site 74 (fig. 2) - East of the Boise King mine - the sample contained 68.259 mg of gold, equivalent to $5.87 per m^3 ($7.68 per yd^3). It was taken from the east end of a large gravel bar with numerous test pits and trenches. There is estimated to be about 55,000 m^3 of unwashed gold-bearing gravel. Just east of this sample site, an elevated alluvial terrace that also has numerous test pits and trenches is estimated to contain over 30,000 m^3. This area is adjacent to and east of the Boise King placer tailing, and is were the river canyon narrows up stream. It is estimated that when the Boise King dredge was operating in the 1940's, it was washing an average of over 152,000 m^3 material per 300 m of river canyon floor. Unwashed gold-bearing material left in the area of sample site 74 per 300 m of river canyon is less than half that mined by the Boise King dredge, and there is a small fraction of that amount of gravel just up stream.

Sample Site 77 (fig. 2) - Middle Fork Boise River - the sample contained 88.829 mg of gold, equivalent to $7.65 per m^3 ($10.00 per yd^3). It was taken from the east end of a gravel bar that has test pits, some placer tailings, a flume ditch, and is overgrown with trees. There is estimated to be about 7,000 m^3 of gold-bearing gravel left at this bar.

Sample Site 75 (fig. 2) - Middle Fork Boise River - the sample contained 31.513 mg of gold, equivalent to $2.71 per m^3 ($3.55 per yd^3). It was taken from the east end of a gravel bar just across the river from the mouth of Black Warrior Creek. There is an estimated 1,500 m^3 of gold-bearing gravel at this locality.

Sample Site 71 (fig. 4) - Middle Fork Boise River - the sample contained 18.099 mg of gold or equivalent to $1.56 per m^3 ($2.04 per yd^3). Along the river, just above and below the sample site, there is an estimated 17,000 m^3 of gold-bearing gravel.

Sample Site 37 (fig. 4) - Decker Creek - the sample contained 77.238 mg of gold, equivalent to $6.64 per m^3 ($8.69 per yd^3). The sample was taken on and close to bedrock, and some mercury and amalgam was found with the gold. The volume of gold-bearing gravel in the area is small.

Sample Site 68 (fig. 4) - Yuba River - the sample contained 10.766 mg of gold, equivalent to $0.93 per m^3 ($1.21 per yd^3). The volume of gold-bearing gravel in the area is small, a few hundred cubic meters.

Alluvial Terraces -

Sample 72 (fig. 2) - Middle Fork Boise River, contains 60.164 mg of gold, equivalent to $5.18 per m^3 ($6.77 per yd^3).

Sample 21 (fig. 5) - Elk Creek, contains 28.937 mg of gold, equivalent to $2.49 per m^3 ($3.26 per yd^3).

Sample 83 (fig. 2) - Middle Fork Boise River, contains 8.149 mg of gold, equivalent to $0.70 per m^3 ($0.92 per yd^3).

Sample 76 (fig. 2) - Middle Fork Boise River, contains 8.057 mg of gold, equivalent to $0.70 per m^3 ($0.91 per yd^3).

Sample 34 (fig. 4) - Grouse Creek, contains 3.873 mg of gold, equivalent to $0.34 per m^3 ($0.44 per yd^3).

Sample 70 (fig. 4) - Middle Fork Boise River, contains 3.452 of mg gold, equivalent to $0.30 per m^3 ($0.39 per yd^3).

Parts of all these alluvial terraces have been worked and have placer tailings running down slope, in some areas covering a hectare or more. Some of the sampled material had been diluted by slope wash and placer tailings. At sample site 72, there is an estimated 600 m^3 of gold-bearing gravel left, and at sample site 70, there appears to be a large, thick wedge of unwashed gravel left.

MINES, PROSPECTS, AND MINERALIZED AREAS, BREADWINNER STUDY AREA

The following pages describe the mines, prospects, and mineralized areas in and adjacent to the Breadwinner study area. The locations of samples taken at these properties are shown on figure 3.

Twin Springs Area

LOCATION: W½, SW¼ sec. 7, T. 4 N., R. 7 E.; and sec. 12, sec. 13, and NW¼ sec. 24, T. 4 N., R. 6 E., (fig. 3, sample localities 38, 40-42, 47, and 51) along the Middle Fork Boise River.

ELEVATION: 1,030 to 1,650 m

ACCESS: Approximately 72 km east from Boise by Hwy. 21 and FS Road 268 (along Middle Fork Boise River).

HISTORY: Placer workings most likely predate 1900, but little information appears in the literature. No historic information was found about the lode prospects in this vicinity.

PRODUCTION: None indicated.

GEOLOGY: In quartz monzodiorite and granite, a zone of altered and mineralized material was found that strikes N. 5° to 10° W., and dips 75° SW, and contains quartz veins, quartz veinlets, sericite, and pyrite. Also in the Tertiary granite are seams and blebs of coarse quartz, feldspar, and epidote, with pyrite, molybdenite, and chalcopyrite (sample locality 47). At sample locality 51, dark lead-and zinc-bearing manganese and iron oxides filling seams and staining fractures were found.

WORKINGS: A caved adit about 25 m long is at sample site 42; George Castle presently is advancing an adit on his property at sample site 47; and remnants remain of dam-site drill roads (sample sites 40, 41, and 51).

SAMPLING: Six samples, two chip and four select, were taken (appendix B, table B-3, samples 38, 40-42, 47, and 51). A select sample (47) taken at George Castle's adit assayed 325 ppm molybdenum, 255 ppm copper, 4.1 ppm silver, and 30 ppm bismuth. A chip sample (42) of the quartz-vein-bearing altered zone assayed 212 ppm zinc, 13 ppm silver, 50 ppm bismuth, and 27 ppm molybdenum. A select sample (51) assayed 1,635 ppm lead, 545 ppm zinc, 9.3 ppm silver, and 35 ppm bismuth. The remaining three samples also contained anomalous zinc, 105 to 129 ppm.

CONCLUSIONS: Anomalous amounts of molybdenum, bismuth, zinc, silver, lead, and copper were found in the Twin Springs area. These assays, and the alteration seen, indicate a minor amount of skarn type in addition to polymetallic veins-type mineralization, was being encountered. Besides having a potential for these types of resources, ore deposit models suggest exploration in the area may lead to the discovery of porphyry copper-molybdenum and/or porphyry molybdenum type resources (Cox and Singer, 1986, p. 73-129). Also, the gold placers in this area may be associated with polymetallic vein, copper porphyry, and copper skarn mineralization (Cox and Singer, 1986, p. 125-261).

Hy Country Claim Group

LOCATION: Prospects examined and sampled in center of sec. 34, T. 5 N., R. 7 E. (fig. 3, sample localities 1-4), but claim group covers parts of secs. 26, 27, 28, 33, and 34, at the northeast border of the study area along the Middle Fork Boise River.

ELEVATION: 1,220 m

ACCESS: Approximately 84 km east from Boise by Hwy. 21 and FS Road 268.

HISTORY: BLM records show that Evelyn Chriswell and Gene Finch located the claim group in 1979 and 1980. However, condition of prospect workings indicates earlier work.

PRODUCTION: None recorded.

GEOLOGY: The workings are in altered and mineralized rocks of the Idaho batholith in a northeast trending structure. Altered and mineralized material contains fine-grained quartz replacing country rocks, quartz veinlets, crystalline-quartz space filling, sericite, pyrite, and oxides of iron. At sample sites 1 and 4, chip samples were taken of structures that strike N. 30° to 40° E., and dip 75° SE. to 81° NW.

WORKINGS: Two caved adits, both estimated to be under 40 m long.

SAMPLING: Four samples, two chip and two select, were taken (appendix B, table B-3, samples 1-4). The two select samples (2 and 3) assayed 1,660 and 1,905 ppb (0.048 and 0.056 oz/ton) gold, 40 and 24 ppm (1.17 and 0.70 oz/ton) silver, and 250 and 132 ppm arsenic. These two samples also have elevated lead, zinc, and molybdenum content. The two chip samples have anomalous gold content.

CONCLUSIONS: Elevated gold and arsenic assays in quartz vein and altered batholith rocks are features similar to those at the nearby Atlanta mining district. These similarities are factors that raise the probability a gold resource may exist on the property. However, no ore grade material was encountered in place, suggesting mineralized material encountered may be spotty or narrow.

Prospect In Section 23

LOCATION: Approximately 300 m west of center of sec. 23, T. 4 N., R. 5 E. (fig. 3, sample localities 49 and 50), near the mouth of Cottonwood Creek at the west border of the study area.

ELEVATION: 1,180 to 1,250 m

ACCESS: Approximately 55 km east from Boise by Hwy. 21 and FS Road 268 along Middle Fork Boise River, then 5.6 km north on FS Road 377 up Cottonwood Creek, and finally 0.8 km overland to the northeast.

HISTORY: No historic information was found about this lode prospect.

PRODUCTION: None recorded.

GEOLOGY: In Tertiary granitics rocks, a zone of altered and mineralized material was found that contains quartz veins, quartz veinlets, sericite, iron oxide psuedomorphs after pyrite, gossan boxwork, and some chlorite and fresh pyrite.

WORKINGS: A caved adit estimated to be over 45 m long, and several prospect pits. Bearing of caved adit believed to be north to N. 10° E.

SAMPLING: Two select samples were taken (appendix B, table B-3, samples 49 and 50). One assayed 235 ppb gold, 17 ppm (0.50 oz/ton) silver, 1,890 ppm zinc, 220 ppm antimony, 165 ppm bismuth, 155 ppm copper, 150 ppm lead, 140 ppm arsenic, 30 ppm tungsten, and 10 ppm molybdenum; and the other assayed 55 ppb gold, 13 ppm (0.38 oz/ton) silver, 418 ppm zinc, 182 ppm lead, 152 ppm copper, 48 ppm arsenic, 28 ppm molybdenum, 18 ppm bismuth, and 8 ppm antimony.

CONCLUSIONS: Type of alteration and anomalous assays of gold and other metals indicate polymetallic vein type mineralization was encountered. Although molybdenum and copper assays were not close to ore grade, ore deposit models suggest potential for porphyry copper-molybdenum and/or porphyry molybdenum type resources (Cox and Singer, 1986, p. 73-129).

Prospect In Section 32

LOCATION: N½, NE¼ sec. 32, T. 5 N., R. 6 E. (fig. 3, sample locality 26), on the northwest border of the study area.

ELEVATION: 2,130 m

ACCESS: Approximately 55 km east from Boise by Hwy. 21 and FS Road 268, then 9.6 km north on FS Road 377 up Cottonwood Creek, and finally 11.2 km to the northeast on FS Road 203 (road to Thorn Creek Butte Lookout) to short jeep trail to the south.

HISTORY: None.

PRODUCTION: None recorded.

GEOLOGY: A prospect pit was dug in altered and mineralized Tertiary granitic rocks. This material contains quartz veins, quartz veinlets, comb quartz, sericite, iron oxide psuedomorphs after pyrite, gossan boxwork, and fresh pyrite.

WORKINGS: One prospect pit.

SAMPLING: One select sample (appendix B, table B-3, sample 26) assayed 240 ppb gold, 4.4 ppm (0.13 oz/ton) silver, and 590 ppm arsenic.

CONCLUSIONS: Type of alteration, and anomalous assays of gold, silver, and arsenic, indicate possible polymetallic vein-type mineralization was encountered. Ore deposit modeling also suggests potential for the discovery of porphyry copper-molybdenum and/or porphyry molybdenum type resources in this area (Cox and Singer, 1986, p. 73-129).

Placers

Twenty-eight 0.08-m^3 (0.1 yd^3 - one is 0.025 yd^3) placer samples (see appendix B, table B-4) were taken adjacent to or in the Breadwinner study area. Thirteen were from elevated alluvial terraces (most over 9 m above the river) and the remaining 15 were from gravel bars and benches near active stream channels. All of the samples are from areas not presently claimed, but not because of a lack of placer gold. Almost all of the potential placer ground along the Middle Fork Boise River to a point just above Alexander Flats and all of the potential placer ground along the North Fork Boise River to Barber Flats was withdrawn as part of the Payette/Boise Reclamation Project in 1904, 1909, and 1910; the Boise Reclamation Project in 1928 and 1937; and power site withdrawals in 1930 (BLM records).

Following are summaries of the more important placers, most of which are adjacent to the study area. The estimated volume of gold-bearing gravel is speculative; the single samples from individual gravel bars are indicative only of what may be found.

Large Gravel Bars - North Fork Boise River - Sample localities 30-32 (fig. 3) -

Sample 32 contained 91.984 mg of gold, equivalent to \$7.91 per m^3 (\$10.35 per yd^3), and is from a bar estimated to contain 65,000 m^3 of gold-bearing gravel.

Sample 30 contained 15.735 mg of gold, equivalent to \$1.35 per m^3 (\$1.77 per yd^3), and is from a bar estimated to contain 70,000 m^3 of gold-bearing gravel.

Sample 31 contained 8.476 mg of gold, equivalent to \$0.73 per m^3 (\$0.95 per yd^3), and is from an area estimated to contain 300,000 m^3 of gold-bearing gravel.

There are a few large gravel bars in this area that were not sampled. No placer tailings were seen on the North Fork Boise River from the Middle Fork to Barber Flats.

Elevated Alluvial Terraces on Middle Fork Boise River (fig. 3)

Sample 7 - contained 50.922 mg of gold, equivalent to \$4.38 m^3 (\$5.73 per yd^3).

Sample 16 - contained 46.546 mg of gold, equivalent to \$4.01 m^3 (\$5.24 per yd^3).

Sample 18 - contained 41.600 mg of gold, equivalent to \$3.58 m^3 (\$4.68 per yd^3).

Sample 44 - contained 34.492 mg of gold, equivalent to \$2.97 m^3 (\$3.88 per yd^3).

Sample 12 - contained 11.245 mg of gold, equivalent to \$0.96 m^3 (\$1.26 per yd^3).

Sample 14 - contained 11.234 mg of gold, equivalent to \$0.96 m^3 (\$1.26 per yd^3).

Sample 37 - contained 9.252 mg of gold, equivalent to $0.80 m^3 ($1.04 per yd^3).

Sample 36 - contained 5.971 mg of gold, equivalent to $0.51 m^3 ($0.67 per yd^3).

Sample 20 - contained 1.819 mg of gold, equivalent to $0.15 m^3 ($0.20 per yd^3).

Sample 45 - contained 1.013 mg of gold, equivalent to $0.08 m^3 ($0.11 per yd^3).

Sample 13 - contained 0.939 mg of gold, equivalent to $0.08 m^3 ($0.11 per yd^3).

All, or portion, of these terraces have been worked and have placer tailings running down slope; in some areas these tailings cover a hectare or more. Because unwashed terrace alluvium couldn't be found at sample sites 13, 20, 36, 37, and 45, the samples were taken of tailings or a mix of slope wash and tailings. Some of the other samples also may have had some slope wash and placer tailings mixed in with unwashed terrace alluvium. Most of the terraces have small volumes of unwashed gravel remaining.

Glory Hole Claim (fig. 3)

Sample 19 - contained 14.990 mg of gold from a 0.019 m^3 (0.025 yd^3) sample, equivalent to $5.16 per m^3 ($6.75 per yd^3).

Sample 48 - contained 28.666 mg of gold, equivalent to $2.47 per m^3 ($3.23 per yd^3).

The Glory Hole is an area more than 90 m above the river that had been hydraulically mined. The two samples were taken at the same site. There appears to be some gold-bearing terrace alluvium remaining, some which extends into the study area. No volume estimate was made because the thickness of the gravel is unknown.

Sample Site 43 - sample contained 15.636 mg of gold, equivalent to $1.35 per m^3 ($1.76 per yd^3) and is from a bar estimated to contain 17,000 m^3 of gold-bearing gravel. Just down stream and across the river, a sample (46) from a much larger bar, possibly more than 100,000 m^3, contained 2.092 mg of gold, equivalent to $0.18 per m^3 ($0.24 per yd^3).

Sample Site 34 - sample contained 9.080 mg of gold, equivalent to $0.78 per m^3 ($1.02 per yd^3) and is from a bar estimated to contain 35,000 m^3 of gold-bearing gravel.

Sample Site 21 - sample contained 8.455 mg of gold, equivalent to $0.73 per m^3 ($0.95 per yd^3) and is from a bar estimated to contain 12,000 m^3 of gold-bearing gravel.

Sample Site 17 - sample contained 8.370 mg of gold, equivalent to $0.72 per m^3 ($0.94 per yd^3) and is from a bar estimated to contain 10,000 m^3 of gold-bearing gravel.

Sample Site 15 - sample contained 7.300 mg of gold, equivalent to $0.63 per m^3 ($0.82 per yd^3) and is from a bar estimated to contain 50,000 m^3 of gold-bearing gravel.

CONCLUSIONS

The Steel Mountain/Yuba River and Breadwinner study areas have no identified mineral resources, but they do have potential for the discovery of gold, silver, copper, lead, zinc, molybdenum, and tungsten resources. Adjacent to the Steel Mountain/Yuba River study area, on Atlanta Hill, Atlanta Gold Corp., has identified reserves with over 31,100 kg (just over one million oz) of contained gold.

Steel Mountain/Yuba River study area

The twelve properties examined in and adjacent to the Steel Mountain/Yuba River study area, to varying degrees, have potential for the discovery of gold resources. The Grouse Creek claim group, Yuba Group, and Spanish Town are areas where alteration appears to be of large lateral extent, ore grade material was encountered, and the type of alteration and mineralization are similar to those found at the Atlanta lode. The Lead Nickel claim, Camp Creek lode, and old workings between Yuba River and Trail Creek also are areas where ore grade mineralization and alteration are similar to those found at the Atlanta lode; however, those mineralization or alteration zones appear much narrower. The two caved adits on upper Decker Creek were dug on a narrow zone of mineralization that, unlike the other properties, is not an Atlanta lode-type mineralization, but a gold-bearing, polymetallic quartz vein type. The remaining five properties, where some anomalous gold or arsenic in altered material was found, are areas that may attract exploration.

If a successful mining operation is started on Atlanta Hill, the interest to explore properties in and adjacent to the study area near Atlanta would increase dramatically. Resources that may be found at the Grouse Creek, Yuba, Lead Nickel, and Camp Creek properties, or miscellaneous prospects between Yuba River and Trail Creek, could possibly be trucked to and processed at facilities in Atlanta. The same can be said about the Rocky Bar area. Successful exploration and development there would lead to a dramatic increase in interest in the Spanish Town, RDO, and RST properties.

Adjacent to the Steel Mountain/Yuba River study area, on the Middle Fork Boise River, several placers were found to contain significant volumes of gold-bearing gravel. The area just east of the Boise King mine appears to contain over 85,000 m^3 of unwashed gravel. Also, along the Middle Fork are several areas with elevated alluvial terraces containing placer tailings. Two elevated terraces with placer tailings are inside the study area, one on Elk Creek and the other near the mouth of Grouse Creek. All of the terraces appear to have small volumes of unwashed, gold-bearing gravel.

Breadwinner study area

Four areas in and adjacent to the Breadwinner study area may generate future exploration interest. In the Twin Springs area molybdenum-copper skarn mineralization and polymetallic vein mineralization were encountered; the area has a potential for copper-molybdenum or molybdenum porphyry deposits. At the prospect in section 23, polymetallic vein-type mineralization was encountered and at the prospect in section 32, anomalous metals were encountered that indicate potential polymetallic vein-type mineralization. These prospects also have potential for copper-molybdenum or molybdenum porphyry. At the Hy Country claim group, Atlanta-type gold mineralization and alteration were encountered; however, indications are that mineralization is either narrow or spotty.

Adjacent to the Breadwinner study area, on the Middle Fork Boise River,

and into the study area, on the North Fork, several placers were found to contain significant volumes of gold-bearing gravel. About a 3 km-stretch of the North Fork, on the north side of and into the study area, has large gravel bars that contain over 400,000 m^3 of unwashed gold-bearing gravel. Also adjacent to the study area, along the Middle Fork, are numerous areas with elevated alluvial terraces and placer tailings. These terraces appear to have small volumes of unwashed gold-bearing gravel.

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APPENDIX A

Listing of lode and placer properties for mining districts adjacent to and in the Steel Mountain/Yuba River and Breadwinner study areas.

Table A-1. Summary of Atlanta and Rocky Bar mining districts; properties and companies mentioned in Idaho Inspector of Mines Annual Reports, 1899 to 1974.

Year Reported	- Mining District	Mines and Companies (page number)
1899	- Atlanta	District mentioned (p. 19)
	- Rocky Bar	District mentioned (p. 19)
1901	- Atlanta	Monarch, Tehoma, and Baltimore (p. 27)
	- Rocky Bar	Sawtooth (p. 27)
1902	- Atlanta	Monarch, Tehoma, and Baltimore (p. 14)
	- Rocky Bar	Sawtooth (p. 14)
1903	- Atlanta	Last Chance, Monarch, Buffalo, Pettit, East Atlanta, Old Chunk, Nimrod, Jerico, West Atlanta, Jessie Burton, Moultrie, Tahoma, Big Lode, Washington, Bay State, Dewey, Webfoot, & Alaska (p. 58-59)
	- Rocky Bar	Ida Elmore, Confederate, Tip Top, Republic, Objection, Flagstaff, Avalanche, & Seventy Six (p. 59)
1904	- Atlanta	Monarch, Pettit, Big Lode, Minerva, Tahoma, Jessie Benton, & Grey Eagle (p. 61-63)
	- Rocky Bar	Mining district just mentioned (p. 60)
1905	- Atlanta	Monarch, Minerva, Atlanta Eagle, Tahoma, & Pettit (p. 58-60)
1906	- Atlanta	Monarch, Pettit, East Atlanta, Minerva, Jesse Benton, Atlanta Eagle, & Tahoma (p. 56-60)
	- Rocky Bar	Ida, Elmore, Pittsburgh, & Junction Bar (p. 63)
1907	- Atlanta	Monarch, Buffalo, Pettit (Bagdad Chase Gold Mining Co.), & Minerva (p. 92-96)
	- Rocky Bar	Vishnu, Ida Elmore, Bonaparte, Bear Creek placer, & Junction Bar placer (p. 96-97)
1908	- Atlanta	Pettit (Bagdad Chase Gold Mining Co.), & Atlanta Mines Co. (p.10-11)
1909	- Atlanta	Bagdad Chase Gold Mining Co., Atlanta Mines Co., Minerva Mining Co., Idaho Gold Mining and Milling Co., Yuba mine, Tahoma Mining and Milling Co., Bixby group (Jesse Benton & Atlanta Eagle), & Boise King Pls. (p. 54-57)
1910	- Atlanta	Atlanta Mines Co., & Minerva Mining Co. (p.10-11)
	- Rocky Bar	Elmore Placer Co. (Junction Bar property) (p. 11)
1911	- Atlanta	Minerva, Bagdad Chase Co., Atlanta Mines Co., & Tahoma (p. 44-45)
	- Rocky Bar	Elmore Placer Co. (Junction Bar property) (p.43-44)
1912	- Atlanta	Boise King Placers (p. 103)
	- Rocky Bar	Elmore Placer Co. (Junction Bar property) (p. 103)
1913	- Atlanta	Atlanta Lode Mines (p. 171)
	- Rocky Bar	Ida-Elmore (p. 171)
1915	- Atlanta	Boise Rochester (formerly Pettit and Bagdad Chase), Monarch, & Minerva (p. 99-100)
	- Rocky Bar	Placer mining at Featherville (managed by Captain Rupert Winters) (p. 99)
1916	- Atlanta	Bagdad-Chase Mining Co., Boise-Rochester Mining Co., & Monarch-Buffalo (p. 34-35)
1917	- Atlanta	Boise-Rochester, & Atlanta Mines Co. (p. 91-92)
1918	- Atlanta	Minerva, Monarch, & Buffalo (p. 86)
	- Rocky Bar	Featherville Placers (p. 86)
1919	- Atlanta	Minerva, Big Lode, Boise-Rochester, & Atlanta Mines Co. (formerly Monarch and Buffalo) (p. 122-123)
	- Rocky Bar	Ella Eagle, Treasure Mines Co., Idaho-Elmore, & Hammond Co. (Featherville placer) (p. 123-124)
1921	- Atlanta	Five Bar Mining Co., Minerva Mining & Milling Co., Tahoma Gold Mines Co., Baltimore, Big Lode, General Pettit, Idaho Bonanza, Monarch, & Old Oliver Diggins (p. 56-59)
	- Rocky Bar	Elk Creek Placers Co., Gold Mines Co., Marsh Creek Mining Co., Old Spanish Town Mines Co., South Park Dredging Co., Forest King, Lenen Con., Minnehaha Placer, Northwestern, Oregonian group, Overland, Red Warrior, Vibrator, Vishnu, & Willow Creek (p. 56-59)

Table A-1. Summary of Atlanta and Rocky Bar mining districts; properties and companies mentioned in Idaho Inspector of Mines Annual Reports, 1899 to 1974 - continued

Year Reported	- Mining District	Mines and Companies (page number)
1922	- Atlanta	Minerva Mining & Milling Co., Tahoma Gold Mines Co., Baltimore, Benton group, Big Lode, Boise Bar placer, Boise Rochester, Capital group, Gold King group, Gunny Sack group, Hazel Queen, Humming Bird, Idaho Bonanza, Jericho group, Middle Boise Lode, Monarch, Montezuma Placer, New Century, Old Oliver Diggins, Piney group, Pride of Atlanta group, Queen River placer, Silver Horde, & Tahoma (p. 84-88)
	- Rocky Bar	Elk Creek Placer Co., Ella & Eagle Consolidated Gold Mining & Development Co., Gold Mines Co., Marsh Creek Mining Co., Rocky Bar Mining Co., South Park Dredging Co., Ada Elmore group, Bonneparte group, Commonwealth, Doolittle group, Evlyn, Forest King, Gold Coin, Keirman group, Mary Ann Minnehaha Placer, Northwest, Ontario, Ophir, Overland, Pittsburgh group Queen of the West, Red Warrior, Stand Off, Sunrise group, Uncle Ben, Vibrator group, Vishnu, White Bird, Wide West, & Willow Creek (p. 84-88
1923	- Atlanta	Atlanta Mines Co., Tahoma Gold Mines Co., Baltimore, Benton group, Big Lode, Boise Bar Placer, Boise Rochester, Capital group, Gold King group Gunny Sack group, Hazel Queen, Humming Bird, Idaho Bonanza, Jericho group, Middle Boise Lode, Monarch, Montezuma Placer, New Century, Old Oliver Diggins, Piney group, Pride of Atlanta group, Queen River Placer Silver Horde, & Tahoma (p. 97-101)
	- Rocky Bar	Bear Creek Gold Mining Co., Ella & Eagle Consolidated Gold Mining & Development Co.,Gold Mines Co., Marsh Creek Mining Co., Old Bonaparte Mining & Development Co., Rocky Bar Mining Co., South Park Dredging Co. Ada Elmore group, Black Ribbon, Bonaparte group, Commonwealth, Doolittle group, Evlyn, Forest King, Gold Coin, Keirman group, Mary Ann, Minnehaha Placer, Northwestern, Ontario, Ophir, Overland, Pittsburgh group, Queen of the West, Red Warrior, Stand Off, Sunrise group, Uncle Ben, Vibrator group, Vishnu, White Bird, Wide West, & Willow Creek (p. 97-101)
1924	- Atlanta	Atlanta Mines Co., Tahoma Gold Mines Co., April Fool, Baltimore, Benton group, Big Lode, Boise Bar, Boise-Rochester, Cabin Claim, Capital, Fourth of July, Gold King group, Granby, Gray Warrior, Greenback, Gunny Sack group, Hazel Queen, Humming Bird, Jericho group, Last Chance, Middle Boise Lode, Monarch, Montezuma Placer, New Century, Old Oliver Diggins, Piney group, Queen River Placer, Silver Horde, Silver Tide, Tahoma, & Yuba Gold Chest (p. 109-113)
	- Rocky Bar	Ella & Eagle Consolidated Gold Mining & Development Co., Idaho Gold Corporation, Marsh Creek Mining Co., Rocky Bar Mining Co., South Park Dredging Co., Ada Elmore group, Alice, Alma Placer group, Bear group, Ben Hur, Big Five, Big Four, Black Diamond, Black Ribbon, Bobolink, Bonanza, Bonaparte, Brooklyn, Cock Robin, Colorado, Cubin Flat, Debs group, Doolittle, Edna, Evelyn, Feather River, Flagstaff, Forest King, Gold Bug, Gold Gate No. 2, Gold Hill, Gold Key, Goldenrod, Keirman group, Keystone, Little Joker Placer, Minnehaha Placer, Mountain View, Northwestern, Ontario, Ophir, Overland, Pittsburgh group, Queen, Red Warrior, Rosetta group, Sunrise group, Sunshine, Tekla, Trinity group, Tumble Bug, Uncle Ben, Vibrator group, White Bird, & Wide West (p. 109-113)
1925	- Atlanta	April Fool, Baltimore, Benton group, Big Lode, Boise Bar, Boise-Rochester Cabin Claim, Capital, Fourth of July, Gold King group, Granby, Gray Warrior, Greenback, Gunny Sack group, Hazel Queen, Humming Bird, Jericho group, Last Chance, Middle Boise Lode, Monarch, Montezuma Placer, New Century, Old Oliver Diggins, Piney group, Queen River Placer, Silver Horde, Silver Tide, Tahoma, & Yuba Gold Chest (p. 129-135)
	- Rocky Bar	Marsh Creek Mining Co., Rocky Bar Mining Co., South Park Dredging Co., Ada Elmore group, Alice, Alma Placer group, Bear group, Ben Hur, Big Five, Big Four, Black Diamond, Black Ribbon, Black Warrior, Bobolink, Bonanza, Bonaparte, Brooklyn, Cock Robbin, Colorado, Cubin Flat, Debs group, Doolittle group, Edna, Evelyn, Feather River, Flagstaff, Forest King, Gold Bug, Gold Gate No. 2, Gold Hill, Gold Key, Goldenrod, Keirman group, Keystone, Little Joker Placer, Minnehaha Placer, Mountain View, Ontario, Ophir, Overland, Pittsburgh group, Queen, Red Warrior, Rosetta group, Sunrise group, Sunshine, Tekla, Trinity group, Tumble Bug, Uncle Ben, Vibrator group, White Bird, Northwestern & Wide West (p. 129-135)

Table A-1. Summary of Atlanta and Rocky Bar mining districts; properties and companies mentioned in Idaho Inspector of Mines Annual Reports, 1899 to 1974 - continued

Year Reported	- Mining District	Mines and Companies (page number)
1926	- Atlanta	Little Queen group, Northwestern Development Co., April Fool, Baltimore, Benton group, Big Lode, Boise Bar, Boise-Rochester, Cabin Claim, Capital, Fourth of July, Gold King group, Granby, Gray Warrior, Greenback, Gunny Sack group, Hazel Queen, Humming Bird, Jericho, group, Last Chance, Middle Boise Lode, Monarch, Montezuma Placer, New Century, Old Oliver Diggins, Piney group, Queen River Placer, Silver Horde, Silver Tide, Tahoma No. 3, & Yuba Gold Chest (p. 131-136)
	- Rocky Bar	Apex Gold Mining Co., Clark Gulch Development Co., Idaho Gold Corp., Marsh Creek Mining Co., Omo Mines Corp., South Park Dredging Co., Ada Elmore group, Alice, Alma Placer group, Bear group, Ben Hur, Big Five, Big Four, Black Diamond, Black Ribbon, Black Warrior, Bobolink, Bonanza, Bonaparte, Brooklyn, Cock Robbin, Colorado, Cubin Flat, Debs group, Doolittle group, Edna, Evelyn, Feather River, Flagstaff, Forest King, Gold Bug, Gold Gate No. 2, Gold Hill, Gold Key, Goldenrod, Keirman group, Keystone, Little Joker Placer, Minnehaha Placer, Mountain View, Northwestern, Ontario, Ophir, Overland, Pittsburgh group, Queen, Red Warrior, Rosetta group, Sunrise group, Sunshine, Tekla, Trinity group, Tumble Bug, Uncle Ben, Vibrator group, White Bird, & Wide West (p. 124-131)
1927	- Atlanta	Little Queen group, Queen Mining and Milling Co., Stanley-Five Bars mining co., April Fool, Baltimore, Benton group, Big Lode, Boise Bar, Boise-Rochester, Cabin Claim, Capital, Fourth of July, Gold King group, Granby, Gray Warrior, Greenback, Gunny Sack group, Hazel Queen, Humming Bird, Jericho group, Last Chance, Middle Boise Lode, Monarch, Montezuma Placer, New Century, Old Oliver Diggins, Piney group, Queen River Placer, Silver Horde, Silver Tide, Tahoma, & Yuba Gold Chest (p. 124-131)
	- Rocky Bar	Apex Gold Mining Co., Blake's Gulch Gold Mining Co., Marsh Creek Mining Co., Rocky Bar Mining Co., South Park Dredging Co., Ada Elmore group, Alice, Alma Placer group, Bear group, Ben Hur, Big Five, Big Four, Black Diamond, Black Ribbon, Black Warrior, Bobolink, Bonanza, Bonaparte group, Brooklyn, Cock Robbin, Colorado, Cubin Flat, Debs group, Doolittle group, Edna, Evelyn, Feather River, Flagstaff, Forest King, Gold Bug, Gold Gate No. 2, Gold Hill, Gold Key, Keirman group, Keystone, Little Joker Placer, Minnehaha Placer, Mountain View, Northwestern, Ontario, Ophir, Overland, Pittsburgh group, Queen, Red Warrior, Rosetta group, Sunrise group, Sunshine, Tekla, Trinity group, Tumble Bug, Uncle Ben, Vibrator group, White Bird, & Wide West (p. 124-131)
1928	- Atlanta	Little Queen group, Northwestern Development Co., Stanley-Five Bars Mining Co., April Fool, Baltimore, Benton group, Big Lode, Boise Bar, Boise-Rochester, Cabin Claim, Capital, Fourth of July, Gold King group, Granby, Gray Warrior, Greenback, Gunny Sack group, Hazel Queen, Humming Bird, Jericho group, Last Chance, Middle Boise Lode, Monarch, Montezuma Placer, New Century, Old Oliver Diggins, Piney group, Queen River Placer, Silver Horde, Silver Tide, Tahoma No. 3, & Yuba Gold Chest (p. 123-129)
	- Rocky Bar	Apex Gold Mining Co., Blake's Gulch Gold Mining Co., Idaho Gold Corp., Marsh Creek Mining Co., South Park Dredging Co., Ada Elmore group, Alice, Alma Placer group, Bear group, Ben Hur, Big Five, Big Four, Black Diamond, Black Ribbon, Black Warrior, Bobolink, Bonanza, Bonaparte group, Brooklyn, Cock Robbin, Colorado, Debs group, Doolittle group, Edna, Evelyn, Flagstaff, Forest King, Gold Bug, Gold Gate No. 2, Gold Key, Kierman group, Keystone, Little Joker Placer, Minnehaha Placer, Mountain View, Northwestern, Ontario, Ophir, Overland, Pittsburgh group Red Warrior, Rosetta group, Sunrise group, Sunshine, Tekla, Trinity group, Tumble Bug, Uncle Ben, Vibrator group, White Bird, & Wide West (p. 123-129)
1929	- Atlanta	Little Queen group, Northwestern Development Co., St. Joseph Lead Co., Stanley-Five Bars Mining Co., April Fool, Baltimore, Benton group, Big Lode, Boise Bar, Boise-Rochester, Cabin Claim, Capital, Fourth of July, Gold King group, Granby, Gray Warrior, Greenback, Gunny Sack group, Hazel Queen, Humming Bird, Jericho group, Last Chance, Middle Boise Lode, Monarch, Montezuma Placer, New Century, Old Oliver Diggins, Piney group, Queen River Placer, Silver Horde, Silver Tide, Tahoma No. 3, & Yuba Gold Chest (p. 144-149)

Table A-1. Summary of Atlanta and Rocky Bar mining districts; properties and companies mentioned in Idaho Inspector of Mines Annual Reports, 1899 to 1974 - continued

Year Reported	- Mining District	Mines and Companies (page number)
1929 - continued	- Rocky Bar	Apex Gold Mining Co., Blake's Gulch Gold Mining Co., Feather River Gold Placer Co., Marsh Creek Mining Co., Rocky Bar Mining Co., South Park Dredging Co., Ada Elmore group, Alice, Alma Placer group, Bear group, Ben Hur, Big Five, Big Four, Black Diamond, Black Ribbon, Black Warrior, Bobolink, Bonanza, Bonaparte group, Brooklyn, Cock Robbin, Colorado, Debs group, Doolittle group, Edna, Evelyn, Flagstaff, Forest King, Gold Bug, Gold Gate No. 2, Gold Key, Kierman group, Keystone, Little Joker Placer, Minnehaha Placer, Mountain View, Northwestern, Ontario, Ophir, Overland, Pittsburgh group, Red Warrior, Rosetta group, Sunrise group, Sunshine, Tekla, Trinity group, Tumble Bug, Uncle Ben, Vibrator group, White Bird, & Wide West (p. 144-149)
1930	- Atlanta	Little Queen group, Minerva Mining & Milling Co., Northwestern Development Co., St. Joseph Lead Co., Stanley-Five Bars Mining Co., April Fool, Baltimore, Benton group, Big Lode, Boise Bar, Cabin Claim, Capital, Fourth of July, Gold King group, Granby, Gray Warrior, Greenback, Gunny Sack group, Hazel Queen, Humming Bird, Jericho group, Little Joker Placer, Middle Boise Lode, Monarch, Montezuma Placer, New Century, Old Oliver Diggins, Piney group, Queen River Placer, Silver Horde, Tahoma No. 3, & Yuba Gold Chest (p. 147-152)
	- Rocky Bar	Apex Gold Mining Co., Feather River Gold Placer Co., Idaho Mines Inc., Marsh Creek Mining Co., South Park Dredging Co., Ada Elmore group, Alice, Alma Placer group, Bear group, Ben Hur, Big Five, Big Four, Black Diamond, Black Ribbon, Black Warrior, Bobolink, Bonanza, Bonaparte group, Brooklyn, Cock Robbin, Colorado, Debs group, Doolittle group, Edna, Evelyn, Flagstaff, Forest King, Gold Bug, Gold Gate No. 2, Gold Key, Kierman group, Keystone, Minnehaha Placer, Mountain View, Northwestern, Ontario, Ophir, Overland, Pittsburgh group, Red Warrior, Rosetta group, Sunrise group, Sunshine, Tekla, Trinity group, Tumble Bug, Uncle Ben, Vibrator group, White Bird, & Wide West (p. 147-152)
1931	- Atlanta	Idaho Pacific Mines Inc., Northwestern Development Co., St. Joseph Lead Co., Stanley-Five Bars Mining Co., April Fool, Baltimore, Benton group, Big Lode, Boise Bar, Cabin Claim, Capital, Fourth of July, Gold King group, Granby, Gray Warrior, Greenback, Gunny Sack group, Hazel Queen, Humming Bird, Jericho group, Little Joker Placer, Middle Boise Lode, Minerva, Monarch, Montezuma Placer, New Century, Old Oliver Diggins, Piney group, Queen River Placer, Silver Horde, Tahoma No. 3, & Yuba Gold Chest (p. 136-143)
	- Rocky Bar	Apex Gold Mining Co., Feather River Gold Placer Co., Idaho Gold Chief Mining Co., Idaho Mines Inc., Marsh Creek Mining Co., Phelps Bros. Mining Co., South Park Dredging Co., Ada Elmore group, Alice, Alma Placer group, Bear group, Ben Hur, Big Five, Big Four, Black Diamond, Black Ribbon, Black Warrior, Bobolink, Bonanza, Bonaparte group, Brooklyn, Cock Robbin, Colorado, Debs group, Doolittle group, Edna, Evelyn, Flagstaff, Forest King, Gold Bug, Gold Gate No. 2, Gold Key, Kierman group, Keystone, Minnehaha Placer, Mountain View, Northwestern, Ontario, Ophir, Overland, Pittsburgh group, Red Warrior, Rosetta group, Sunrise group, Sunshine, Tekla, Trinity group, Tumble Bug, Uncle Ben, Vibrator group, White Bird, & Wide West (p. 136-143)
1932	- Atlanta	Idaho Pacific Mines Inc., Northwestern Development Co., St. Joseph Lead Co., Stanley-Five Bars Mining Co., Winner Group, April Fool, Baltimore, Benton group, Big Lode, Boise Bar, Cabin Claim, Capital, Fourth of July, Gold King group, Granby, Gray Warrior, Greenback, Gunny Sack group, Hazel Queen, Humming Bird, Jericho group, Little Joker Placer, Middle Boise Lode, Minerva, Monarch, Montezuma Placer, New Century, Old Oliver Diggins, Piney group, Queen River Placer, Silver Horde, Tahoma No. 3, & Yuba Gold Chest (p. 134-139)
	- Rocky Bar	Apex Gold Mining Co., Feather River Gold Placer Co., Idaho Gold Chief Mining Co., Idaho Mines Inc., Lincoln Mines Inc., Marsh Creek Mining Co., Phelps Bros. Mining Co., South Park Dredging Co., Ada Elmore group, Alice, Alma Placer group, Bear group, Ben Hur, Big Five, Big Four, Black Diamond, Black Ribbon, Black Warrior, Bobolink, Bonanza, Bonaparte group, Brooklyn, Cock Robbin, Colorado, Debs group, Doolittle group, Edna, Evelyn, Flagstaff, Forest King, Gold Gate No. 2, Gold Key, Kierman group, Keystone, Minnehaha Placer, Mountain View, Northwestern, Ontario, Ophir, Overland, Pittsburgh group, Red Warrior, Rosetta group, Sunrise group, Sunshine, Tekla, Trinity group, Tumble Bug, Uncle Ben, Vibrator group, White Bird, & Wide West (p. 134-139)

Table A-1. Summary of Atlanta and Rocky Bar mining districts; properties and companies mentioned in Idaho Inspector of Mines Annual Reports, 1899 to 1974 - continued

Year Reported	- Mining District	Mines and Companies (page number)
1933	- Atlanta	Idaho Pacific Mines Inc., Northwestern Development Co., St. Joseph Lead Co., Stanley-Five Bars Mining Co., E. F. Money, Twin River Placer Mines Co., April Fool, Baltimore, Benton group, Big Lode, Boise Bar, Cabin Claim, Capital, Fourth of July, Gold King group, Granby, Gray Warrior, Greenback, Gunny Sack group, Hazel Queen, Humming Bird, Jericho group, Little Joker Placer, Middle Boise Lode, Minerva, Monarch, Montezuma Placer, New Century, Old Oliver Diggins, Piney group, Queen River Placer, Silver Horde, Tahoma No. 3, & Yuba Gold Chest (p. 127-133)
	- Rocky Bar	Apex Gold Mining Co., Feather River Gold Placer Co., Idaho Gold Chief Mining Co., Idaho Mines Inc., Lincoln Mines Inc., Marsh Creek Mining Co., Phelps Bros. Mining Co., South Park Dredging Co., Ada Elmore group, Alice, Alma Placer group, Bear group, Ben Hur, Big Five, Big Four, Black Diamond, Black Ribbon, Black Warrior, Bobolink, Bonanza, Bonaparte group, Brooklyn, Cock Robbin, Colorado, Debs group, Doolittle group, Edna, Evelyn, Flagstaff, Forest King, Gold Gate No. 2, Gold Key, Kierman group, Keystone, Minnehaha Placer, Mountain View, Northwestern, Ontario, Ophir, Overland, Pittsburgh group, Red Warrior, Rosetta group, Sunrise group, Sunshine, Tekla, Trinity group, Tumble Bug, Uncle Ben, Vibrator group, White Bird, & Wide West (p. 127-133)
1934	- Atlanta	Coronado Gold Mines Inc., Northwestern Development Co., St. Joseph Lead Co., Stanley-Five Bars Mining Co., Twin River Placer Mines Co., Winner Group, April Fool, Alladin, Benton group, Big Lode, Boise Bar, Cabin Claim, Capital, Fourth of July, Gold King group, Granby, Gray Warrior, Green Back, Hazel Queen, Humming Bird, Little Joker Placer, Minerva, Monarch, Tahoma No. 3, & White Bean (p. 147-153)
	- Rocky Bar	Apex Gold Mining Co., Canada Gold Mines Inc., Idaho Gold Chief Mining Co., Idaho Mines Inc., Idaho Pacific Mines Inc., Marsh Creek Mining Co., Phelps Bros. Mining Co., Ada Elmore group, Alice, Alma Placer group, Bear Creek Placer, Big Five, Big Four, Black Ribbon, Black Warrior, Brooklin, Chieftain Con., Edna, Forest King, Happy Thought, Kierman group, Keystone, Mountain View, Northwestern, Ontario, Overland, Pittsburgh group, Rosetta group, Sunrise group, Sunshine, Sonoma, Trinity group, Vibrator group, White Bird, & Wide West (p. 147-153)
1935	- Atlanta	Atlanta Gold Mine Corp., Coronado Gold Mines Inc., Good Luck Group, Minerals Exploration Co., Northwestern Development Co., St. Joseph Lead Co., Stanley-Five Bars Mining Co., Winner Group, April Fool, Alladin, Benton group, Big Lode, Boise Bar, Cabin Claim, Capital, Fourth of July, Gold King group, Granby, Gray Warrior, Green Back, Hazel Queen, Humming Bird, Little Joker Placer, Minerva, Monarch, Tahoma, & White Bean (p. 178-183)
	- Rocky Bar	Apex Gold Mining Co., Idaho Gold Chief Mining Co., Idaho Mines Inc., Idaho Pacific Mines Inc., Marsh Creek Mining Co., Phelps Bros. Mining Co., Ada Elmore group, Alice, Alma Placer group, Bear Creek Placer, Big Five, Big Four, Black Ribbon, Black Warrior, Brooklin, Chieftain Con., Edna, Forest King, Happy Thought, Kierman group, Keystone, Mountain View, Northwestern, Ontario, Overland, Pittsburgh group, Rosetta group, Sunrise group, Sunshine, Sonoma, Trinity group, Vibrator group, White Bird, & Wide West group (p. 178-183)
1936	- Atlanta	Atlanta Gold Mine Corp., Good Luck Group, Last Chance Mining Co., Minerals Exploration Co., Northwestern Development Co., St. Joseph Lead Co., Stanley-Five Bars Mining Co., Winner Group, April Fool, Alladin, Benton group, Big Lode, Boise Bar, Cabin Claim, Capital, Fourth of July, Gold King group, Granby, Gray Warrior, Green Back, Hazel Queen, Humming Bird, Little Joker Placer, Minerva, Monarch, Tahoma, & White Bean (p. 171-177)
	- Rocky Bar	Apex Gold Mining Co., Canada Gold Mines Inc., Idaho Gold Chief Mining Co., Idaho Mines Inc., Idaho Pacific Mines Inc., Marsh Creek Mining Co., Phelps Bros. Mining Co., Wide West Mining and Milling Corp., Ada Elmore group, Alice, Alma Placer group, Bear Creek Placer, Big Five, Big Four, Black Ribbon, Black Warrior, Brooklin, Chieftain Con., Edna, Forest King, Happy Thought, Kierman group, Keystone, Mountain View, Northwestern, Ontario, Overland, Pittsburgh group, Rosetta group, Sunrise group, Sunshine, Sonoma, Trinity group, Vibrator group, White Bird, & Wide West group (p. 171-177)

Table A-1. Summary of Atlanta and Rocky Bar mining districts; properties and companies mentioned in Idaho Inspector of Mines Annual Reports, 1899 to 1974 - continued

Year Reported	- Mining District	Mines and Companies (page number)
1937	- Atlanta	Atlanta Gold Mine Corp., Good Luck Group, Hi-Bar Mining Co., Last Chance Mining Co., Minerals Exploration Co., Northwestern Development Co., St. Joseph Lead Co., Stanley-Five Bars Mining Co., Winner Group, April Fool, Alladin, Benton group, Big Lode, Boise Bar, Cabin Claim, Capital, Fourth of July, Gold King group, Granby, Gray Warrior, Green Back, Hazel Queen, Humming Bird, Little Joker Placer, Minerva, Monarch, Tahoma, & White Bean (p. 152-165)
	- Rocky Bar	Apex Gold Mining Co., Canada Gold Mines Inc., Elk Creek Spanish Town Mines Inc., Idaho Gold Chief Mining Co., Idaho Mines Inc., Idaho Pacific Mines Inc., Marsh Creek Mining Co., Phelps Bros. Mining Co., Ada Elmore group, Alice, Alma Placer group, Bear Creek Placer, Big Five, Big Four, Black Ribbon, Black Warrior, Brooklin, Chieftain Con., Edna, Forest King, Happy Thought, Kierman group, Keystone, Mountain View, Northwestern, Ontario, Overland, Pittsburgh group, Rosetta group, Sunrise group, Sunshine, Sonoma, Trinity group, Vibrator group, White Bird, & Wide West group (p. 152-165)
1938	- Atlanta	Atlanta Gold Mine Corp., Big Lode, Boise-Rochester, Good Luck Group, Gray Eagle, Jessie Benton, Last Chance Mining Co., Minerva, Monarch, Pal Group, Petit, St. Joe Lead Co., Stanley-Five Bars Mining Co., Talache, & Winner Group (p. 152-156)
	- Rocky Bar	Ada-Elmore, Apex Gold Mining Co., Canada Gold Mines Inc., Elk Creek Spanish Town Mines Inc., Feather River Placer, Flagstaff Mining Co., Ida-Elmore, Idaho Mines Inc., Idaho Pacific Mines Inc., Independence & Empire, Mountain Goat, Marsh Creek Mining Co., Rocky Bar Placer, & Sky Line & Ophir Bill (p. 152-156)
1939	- Atlanta	Big Lode, Boise-Rochester, Good Luck Group, Grey Eagle, Jessie Benton, Last Chance Mining Co., Minerva, Monarch, New Liberty Mining Co., Pal Group, Petit, St. Joe Lead Co., Stanley-Five Bars Mining Co., Talache Mines Inc., & Winner Group (p. 199-203)
	- Rocky Bar	Ada-Elmore, Apex Gold Mining Co., Canada Gold Mines Inc., Flagstaff Mining Co., Glen Eden, Hard Scrabble, Idaho Gold Chief Mining Co., Idaho Mines Inc., Idaho Pacific Mines Inc., Independence & Empire, Mountain Goat, Marsh Creek Mining Co., & Sky Line & Ophir Bill (p. 199-203)
1940	- Atlanta	Big Lode, Boise King Placers, Boise-Rochester, Good Luck Group, Grey Eagle, Jessie Benton, Last Chance Mining Co., Minerva, Monarch, New Liberty Mining Co., Pal Group, Petit, St. Joe Lead Co., Stanley-Five Bars Mining Co., Talache Mines Inc., & Winner Group (p. 137-141)
	- Rocky Bar	Apex Gold Mining Co., Canada Gold Mines Inc., Flagstaff Mining Co., Idaho Gold Chief Mining Co., Idaho Pacific Mines Inc., Independence & Empire, Mountain Goat, Marsh Creek Mining Co., & Sky Line & Ophir Bill (p. 137-141)
1941	- Atlanta	Atlanta Gold Mine Corp., Good Luck Group, Talache Mines Inc., & Winner Group (p. 182-184)
	- Rocky Bar	Marsh Creek Mining Co. (p. 182-184)
1942	- Atlanta	Boise King Placers Partnership, Good Luck Group, New Liberty Mining Co., Stanley-Five Bars Mining Co., Talache Mines Inc., & Winner Group (p. 112-115)
	- Rocky Bar	Apex Gold Mining Co., & Marsh Creek Mining Co., (p. 112-115)
1943	- Atlanta	Boise King Placers Partnership, Good Luck Group, Talache Mines Inc., & Winner Group (p. 164-165)
	- Rocky Bar	Flag Staff Mining Co., & Marsh Creek Mining Co. (p. 164-165)
1944	- Atlanta	Boise King Placers Partnership, Good Luck Group, Talache Mines Inc., & Winner Group (p. 136-137)
	- Rocky Bar	Flag Staff Mining Co., Golden Sunrise Mining Co., & Marsh Creek Mining Co. (p. 136-137)
1945	- Atlanta	Boise King Placers Partnership, Good Luck Group, Talache Mines Inc., & Winner Group (p. 176-177)
	- Rocky Bar	Flag Staff Mining Co., Golden Sunrise Mining Co., & Marsh Creek Mining Co. (p. 176-177)
1946	- Atlanta	Good Luck Group, Pyramid Mining Co., Talache Mines Inc., & Winner Group (p. 174-175)
	- Rocky Bar	Marsh Creek Mining Co. (p. 174-175)

Table A-1. Summary of Atlanta and Rocky Bar mining districts; properties and companies mentioned in Idaho Inspector of Mines Annual Reports, 1899 to 1974 - continued

Year Reported	- Mining District	Mines and Companies (page number)
1947	- Atlanta	Atlanta Gold Mine Corp., Pyramid Mining Co., & Talache Mines Inc. (p. 155-157)
	- Rocky Bar	Apex Gold Mining Co., & Marsh Creek Mining Co. (p. 155-157)
1948	- Atlanta	Good Luck Group, Talache Mines Inc., & Winner Group (p. 157-159)
	- Rocky Bar	Flag Staff Mining Co., Golden Sunrise Mining Co., & Marsh Creek Mining Co. (p. 157-159)
1949	- Atlanta	Talache Mines Inc. (p. 150-153)
	- Rocky Bar	Flag Staff Mining Co., Golden Sunrise Mining Co., Idaho Gold Chief Mining Co., & Marsh Creek Mining Co. (p. 157-159)
1950	- Atlanta	Atlanta Gold Mine Corp., & Talache Mines Inc. (p. 166-169)
	- Rocky Bar	Golden Sunrise Mining Co., Idaho Gold Chief Mining Co., & Marsh Creek Mining Co. (p. 166-169)
1951	- Atlanta	Little Queen Mines Inc., & Talache Mines Inc. (p. 49-51)
	- Rocky Bar	Golden Sunrise Mining Co., & Marsh Creek Mining Co. (p. 49-51)
1952	- Atlanta	Atlanta Gold Mine Corp., Little Queen Mines Inc., & Talache Mines Inc. (p. 89-91)
	- Rocky Bar	Golden Sunrise Mining Co., Idaho Gold Chief Mining Co., & Western Mines Inc. (p. 89-91)
1953	- Atlanta	Atlanta Gold Mine Corp., Little Queen Mines Inc., & Talache Mines Inc. (p. 118-121)
	- Rocky Bar	Golden Sunrise Mining Co., Idaho Gold Chief Mining Co., & Marsh Creek Mining Corp. (p. 89-91)
1954	- Atlanta	Talache Mines Inc. (p. 100-102)
	- Rocky Bar	Golden Sunrise Mining Co., Idaho Gold Chief Mining Co., & Western Consolidated Mines Inc. (p. 100-102)
1955	- Atlanta	Little Queen Mines Inc., & Talache Mines Inc. (p. 97-101)
	- Rocky Bar	Bozeman Uranium Exploration Corp., Golden Sunrise Mining Co., Idaho Gold Chief Mining Co., Marsh Creek Mining Corp., & Western Consolidated Mines Inc. (p. 97-101)
1957	- Atlanta	Talache Mines Inc. (p. 101-103)
	- Rocky Bar	Golden Sunrise Mining Co., Idaho Gold Chief Mining Co., Marsh Creek Mining Corp., & Western Consolidated Mines Inc. (p. 101-103)
1958	- Atlanta	Little Queen Mines Inc., & Talache Mines Inc. (p. 60-62)
	- Rocky Bar	Golden Sunrise Mining Co., Idaho Gold Chief Mining Co., Kaslo Mines Corp., Marsh Creek Mining Corp., Pacific Exploration Ltd., & Western Consolidated Mines Inc. (p. 60-62)
1959	- Atlanta	Little Queen Mines Inc., & Talache Mines Inc. (p. 66-67)
	- Rocky Bar	Golden Sunrise Mining Co., Idaho Gold Chief Mining Co., Kaslo Mines Corp., & Marsh Creek Mining Corp. (p. 66-67)
1960	- Atlanta	Talache Mines Inc. (p. 51)
	- Rocky Bar	Golden Sunrise Mining Co., & Idaho Gold Chief Mining Co. (p. 51)
1961	- Atlanta	Talache Mines Inc. (p. 93-94)
	- Rocky Bar	Golden Sunrise Mining Co., & Idaho Gold Chief Mining Co. (p. 93-94)
1962	- Atlanta	Talache Mines Inc. (p. 58-59)
	- Rocky Bar	Golden Sunrise Mining Co., & Idaho Gold Chief Mining Co. (p. 58-59)
1964	- Atlanta	Talache Mines Inc. (p. 113-115)
	- Rocky Bar	Golden Sunrise Mining Co., & Idaho Gold Chief Mining Co. (p. 113-115)
1965	- Atlanta	Talache Mines Inc. (p. 60-61)
	- Rocky Bar	Golden Sunrise Mining Co. (p. 60-61)
1966	- Atlanta	Talache Mines Inc. (p. 79-80)
	- Rocky Bar	Golden Sunrise Mining Co. (p. 79-80)
1968	- Atlanta	Little Queen Mines Inc. (p. 89-90)
	- Rocky Bar	Golden Sunrise Mining Co. (p. 89-90)

Table A-1. Summary of Atlanta and Rocky Bar mining districts; properties and companies mentioned in Idaho Inspector of Mines Annual Reports, 1899 to 1974 - continued

Year Reported	- Mining District	Mines and Companies (page number)
1970	- Rocky Bar	Golden Sunrise Mining Co., Marsh Creek Mining Co., & Williams Mining Co. (p. 125-126)
1971	- Atlanta	Little Queen Mng. Co., & E. T. Seaton (Golden Stringer) (p. 75)
1972	- Atlanta	Little Queen Mng. Co., & E. T. Seaton (Golden Stringer) (p. 93-94)
	- Rocky Bar	Marsh Creek Mining Co. (p. 93-94)
1974	- Atlanta	Little Queen Mng. Co., Earl Moosman (Tahoma), & E. T. Seaton (Golden
	- Rocky Bar	Stringer) (p. 47)

Table A-2. Summary of Atlanta and Rocky Bar mining districts; properties and companies mentioned in The Mines Handbook and Mines Register reports 1916 to 1971.

Rpt.Yr.- Report Name	- Mng. Dist.	Mines and/or Companies (page numbers)
1916 - The Mines Handbook	- Atlanta	Boise Rochester Mining Co. (p. 232)
1918 - Do.	- Atlanta	Boise Rochester Mining Co. (p. 811)
1920 - Do.	- Atlanta	Atlanta Mines Co. (p. 636), & Boise King Placers Co. (p. 639)
1922 - Do.	- Atlanta	Atlanta Mines Co. (p. 712), Boise King Placers Co. (p. 719), & Boise Rochester Mine (p. 720)
	- Rocky Bar	Treasure Mines Co. (p. 813)
1925 - Do.	- Atlanta	Atlanta Mines Co. (p. 846), Boise King Placers Co. (p. 855), Boise Rochester Mine (p. 855), Minerva Mining & Milling Co. (p. 945), & Tahoma Gold Mines Co. (p. 983)
	- Rocky Bar	Treasure Mines Co. (p. 986)
1926 - Do.	- Atlanta	Atlanta Mines Co. (p. 753), Boise Rochester Mine (p. 763), Minerva Mining & Milling Co. (p. 868), & Tahoma Gold Mines Co. (p. 915)
1931 - Do.	- Atlanta	Atlanta Mines Co. (property leased to St. Joe Lead Co.) (p. 906), Boise Rochester Mine (property leased to St. Joe Lead Co.) (p. 920), Minerva Mining & Milling Co. (p. 1063), & Tahoma Gold Mines Co. (p. 1123)
	- Rocky Bar	Rocky Bar Mining Co. (p. 1097)
1937 - Mines Register	- Atlanta	Last Chance Mining Co. (p. 511)
1940 - Do.	- Atlanta	Atlanta Gold Mine Corp. (p. 103), Atlanta Mines Co. (p. 104), Talache Mines Inc. (leasing Boise-Rochester and Monarch mines) (p. 513-514), Yuba Milling & Mining Co. (p. 571), & Yuba Mines Inc. (p. 571)
1942 - Do.	- Atlanta	Boise King Mine (p. 59), Minerva Mine (p. 195), Talache Mines Inc. (p. 276), & Yuba Mines Inc. (p. 307)
1949 - Do.	- Atlanta	Boise King Placers (p. 70), & Talache Mines Inc. (p. 338)
1952 - Do.	- Atlanta	Atlanta Gold Mine Corp. (p. 51), Monarch Mine (p. 287), & Talache Mines Inc. (p. 883)
1956 - Do.	- Atlanta	Talache Mines Inc. (p. 411)
1963 - Do.	- Atlanta	Talache Mines Inc. (p. 301)
1969 - Do.	- Atlanta	Talache Mines Inc. (p. 291)
1971 - Do.	- Atlanta	Talache Mines Inc. (p. 282)

Table A-3. Summary of Atlanta and Rocky Bar mining districts; properties and companies mentioned in Mineral Resources of the United States annual reports 1905 to 1951.

Rpt.Yr.- Mng. Dist.	Mines and/or Companies (page numbers)
1905 - Atlanta	Minerva Mining Co., Spears American Syndicate (Tahoma mine), Washburn Milling Co. (Big Lode mine), & Atlanta Mines Co. (p. 231)
1906 - Atlanta	Atlanta Mines Co. (Buffalo mine), Monarch and Last Chance mines (p. 257)
1907 - Atlanta	Bagdad-Chase Gold Mining Co. (Pettit mill), Atlanta Mines Co. (Monarch mine), Minerva Mining Co., & Bonanza Mining and Investment Co. (Sunrise placer) (p. 297)
- Rocky Bar	Gray Warrior Mining Co. (placer) & Bear Creek placer operations (p. 297)
1908 - Atlanta	Atlanta Mines Ltd., Minerva, & Bagdad-Chase Mining Co. (Pettit mine) (p. 423)
1909 - Atlanta	Minerva, Bagdad-Chase Gold Mining Co. (Pettit mine), Monarch, Boise King placer, & Idaho Bonanza placer (p. 347)
- Rocky Bar	mentions small production (p. 347)
1910 - Atlanta	Atlanta Mines Co., Bagdad-Chase mine, Minerva mine, & East Atlanta mine (p. 459)
- Rocky Bar	Bonaparte mine & Bear Creek placers (p. 459)
1911 - Atlanta	Bagdad Chase mine, Atlanta mine, & Minerva mine (p. 591)
- Rocky Bar	Bonaparte mine & Feather River placers (p. 591)
1912 - Atlanta	Minerva mine, Atlanta Mines Co., & Bagdad Chase Co. (p. 724)
- Rocky Bar	Black Ribbon & Elmore Placer Co. (Feather River property) (p. 724)
1913 - Atlanta	Minerva mine, Bagdad Chase mine, Atlanta mine, & Boise King Placers Co. (p. 773)
- Rocky Bar	Feather River placer (p. 773)
1914 - Atlanta	Bagdad Chase mine, Minerva mine, Atlanta mine, & Boise King placer (p. 620)
- Rocky Bar	Elmore Placer Co. (Feather River property) (p. 620)
1915 - Atlanta	Boise Rochester Mining Co. (General Pettit mine), Atlanta mine, Boise King placer, & Idaho Bonanza placer (p. 543)
- Rocky Bar	Elmore Placer Mining Co. (Feather River property), Overland, & Tip Top (p. 543)
1916 - Atlanta	Boise Rochester Mining Co., Atlanta Leasing Co. (Buffalo, Monarch, and Last Chance mines) & Jay Hawker (p. 584)
- Rocky Bar	Elmore Placer Co. (p. 584)
1917 - Atlanta	Boise Rochester mine & Atlanta Mines Co. (p. 477)
- Rocky Bar	small production mentioned (p. 477)
1918 - Atlanta	Boise Rochester property & Idaho Bonanza placer (p. 480)
- Rocky Bar	Vibrator (p. 480)
1919 - Atlanta	General Pettit mine, Atlanta Mines Co., Minerva mine, & Idaho Bonanza placer (p. 468)
- Rocky Bar	Vibrator, & Ella & Eagle (p. 468)
1920 - Atlanta	Big Lode mine, Atlanta mine, General Pettit mine, & Minerva mine (p. 252)
1921 - Atlanta	Atlanta mine, General Pettit mine, Minerva mine, & Big Lode mine (p. 411)
- Rocky Bar	South Park Dredging Co., Major property, & Idaho Gold Corp. (Vishnu mine) (p. 411)
1922 - Atlanta	placer gold from bench gravel of Middle Boise River (p. 235)
- Rocky Bar	operation of the large electric dredge at Featherville (p. 234)
1923 - Atlanta	St. Joseph Lead Co. (Atlanta group), Hazel Queen mine, & Idaho Bonanza placer (p. 391)
- Rocky Bar	South Park Dredging Co. & Rocky Bar Mining Co. (Lison group) (p. 391)
1924 - Atlanta	placer gold from banks of Middle Boise River (p. 271)
- Rocky Bar	South Park Dredging Co. (p. 271)
1925 - Atlanta	Winner or Camp Bird property (p. 535)
- Rocky Bar	South Park Dredging Co. & Vishnu mine (p. 535)
1926 - Atlanta	St. Joseph Lead Co. (Monarch and Boise Rochester mines), Winner group, & Rose placer (p. 439)
- Rocky Bar	South Park Dredging Co. & Apex Gold Mining Co. (West Ophir group) (p. 438)
1928 - Atlanta	Winner group (p. 668)
- Rocky Bar	South Park Dredging Co. (p. 668)
1929 - Atlanta	St. Joseph Lead Co. (General Pettit and Monarch) & Winner group (p. 391)
- Rocky Bar	South Park Dredging Co. (p. 390)
1930 - Atlanta	St. Joseph Lead Co. (Monarch and Boise-Rochester groups), Winner group, Joe Surger, Twilegar, Kinsela, & Campbell (p. 638)
- Rocky Bar	South Park Dredging Co. (p. 638)
1931 - Atlanta	Baker and Gardner placer, & Winner group (p. 456)
- Rocky Bar	Feather River Gold Placer Co. & Tempest-Golden Chariot-Alice O'Ceal group (p. 456)
1933 - Atlanta	St. Joseph Lead Co. (Boise-Rochester), & Atlanta Mines group (p. 107)
1934 - Atlanta	St. Joseph Lead Co. (Boise-Rochester) (p. 143 & 144)
1935 - Atlanta	St. Joseph Lead Co. (Boise-Rochester) (p. 142)
1936 - Atlanta	St. Joseph Lead Co. (Boise-Rochester) (p. 206 & 207)
1937 - Atlanta	Boise-Rochester, & Last Chance Mining Co. (p. 396)
- Rocky Bar	Canada Gold Mines, Inc. (p. 396)

Table A-3. Summary of Atlanta and Rocky Bar Mining Districts; properties and companies mentioned in, Mineral Resources of the United States annual reports 1905 to 1951 -- continued

Rpt.Yr.-	Mng. Dist.	Mines and/or Companies (page numbers)
1938	- Atlanta	Boise-Rochester, Sawtooth Co., Talache Mines, Inc., Last Chance Mining Co. (Atlanta Mines), & Monarch (p. 322)
1939	- Atlanta	Talache Mines, Inc. (Boise-Rochester), Last Chance Mining Co. (Atlanta property) (p. 351)
	- Rocky Bar	Feather River Placer Mining Co., Hunter, Empire, & Big Waters (p. 351)
1940	- Atlanta	Talache Mines, Inc. (Boise-Rochester), Last Chance Mining Co. (Atlanta Mines/Monarch), Boise Bar, Buck Creek, McKibbin, Honey Bee, & Rex (p.327)
	- Rocky Bar	Avalanche-Richmond, Passover, Empire, Vishnue, Daly, & Black Ribbon (p. 327)
1940	- Atlanta	Talache Mines, Inc. (Boise-Rochester) & Minerva (p. 343)
	- Rocky Bar	Bonaparte, & Avalanche-Richmond (p. 343)
1941	- Atlanta	Talache Mines, Inc. (Boise-Rochester) & Boise King Placers (p. 349)
	- Rocky Bar	Avalanche-Richmond, Luck, Duces Wild, & Jungo (p. 349)
1942	- Atlanta	Talache Mines, Inc. & Boise King Placers (p. 365)
1943	- Atlanta	Talache Mines, Inc. (p. 357)
1944	- Atlanta	Talache Mines, Inc. (Boise-Rochester) (p. 341)
1945	- Atlanta	Talache Mines, Inc. (Boise-Rochester) (p. 357)
1946	- Atlanta	Talache Mines, Inc. (Boise-Rochester), & Pyramid Mining Co. (p. 1427)
1947	- Atlanta	Talache Mines, Inc. (p. 1396)
1948	- Atlanta	Talache Mines, Inc. (Boise-Rochester) (p. 1487)
1949	- Atlanta	Talache Mines, Inc. (p. 1459)
1950	- Atlanta	Talache Mines, Inc. (p. 1481)
1951	- Atlanta	Talache Mines, Inc. (Boise-Rochester) (p. 1480)

Table A-4. Summary of placer properties adjacent to the Breadwinner study area and mentioned in Idaho Inspector of Mines Annual Reports, 1921 to 1942.

Property or Company - Approx. Locat.	Owner(s), P.O.	Rpts. for the Year and page
Boise County		
Bull Durham Pl. - Boise River	I.I.Youngblood, Boise	1926, 28th pg.83; 1927, 29th pg.90; 1928, 30th pg.84; 1929, 31st pg.104; 1930, 32nd pg.103; 1931, 33rd pg.93; 1932, 34th pg.91; 1933, 35th pg.90; 1934, 36th pg.107; 1935, 37th pg.139; 1936, 38th pg.133; 1937, 39th pg.121.
First Security Mng. from leased Logan Pl.Assoc. - Twin Spring Dist.	W.L.Smith & Don F. Smith, Boise	1933, 35th pg.86; 1934, 36th pg.102; 1935, 37th pg.135; 1936, 38th pg.128.
Golden Dream Mng. - North Fork Boise Rv.	W.J.Wills & C.M.Williams, Boise	1931, 33rd pg.88; 1932, 34th pg.87; 1933, 35th pg.87; 1934, 36th pg.102.
Hard Times	C.M.Hunt, Twin Springs	1921, 23rd pg.31; 1922, 24th pg.50; 1923, 25th pg.69; 1924, 26th pg.75; 1925, 27th pg.93; 1926, 28th pg.84; 1927, 29th pg.91; 1928, 30th pg.85; 1929, 31st pg.105; 1930, 32nd pg.104; 1931, 33rd pg.93; 1932, 34th pg.91; 1933, 35th pg.91; 1934, 36th pg.107; 1935, 37th pg.140; 1936, 38th pg.134; 1937, 39th pg.122.
Highland Valley - Barber	P.J.Smith, Barber	1924, 26th pg.75; 1925, 27th pg.93; 1926, 28th pg.84; 1927, 29th pg.91; 1928, 30th pg.85; 1929, 31st pg.105; 1930, 32nd pg.104; 1931, 33rd pg.93; 1932, 34th pg.91; 1933, 35th pg.91; 1934, 36th pg.107; 1935, 37th pg.140; 1936, 38th pg.134; 1937, 39th pg.122.
Sheep Creek Mng. - Twin Springs	J.J.Kinsela & Grace M.Kinsela, Twin Springs	1939, 41st pg.170; 1940, 42nd pg.109.
Tuxedo Placer - Boise River	C.J.Schooler, et al, Boise	1926, 28th pg.85; 1928, 30th pg.85; 1929, 31st pg.106; 1930, 32nd pg.104; 1931, 33rd pg.93; 1932, 34th pg.91; 1933, 35th pg.92; 1934, 36th pg.108; 1935, 37th pg.141; 1936, 38th pg.135.
Elmore County		
Birch Creek Placer - Middle Fork Boise	Jack McKinnis	1939, 41st pg.201.
Bread Winner Creek - Middle Fork Boise	Frank A. Flaharty	1939, 41st pg.201.
Buckhorn - Twin Springs	J.N.Neinmier, Twin Springs	1921, 23rd pg.58; 1922, 24th pg.87; 1923 25th, pg.100.
Eureka - Twin Springs	W.L.West, Twin Springs	1921, 23rd pg.58; 1922, 24th pg.87; 1923, 25th, pg.100; 1924, 26th pg.112; 1925, 27th pg.133; 1926, 28th pg.129; 1927, 29th pg.135; 1928, 30th pg.128; 1929, 31st pg.147; 1930, 32nd pg.151; 1931, 33rd pg.141; 1932, 34th pg.138; 1933, 35th pg.132.
First Security Mng. from leased Logan Pl.Assoc. - Twin Spring Dist.	W.L.Smith & Don F. Smith, Boise	1933, 35th pg.128; 1934, 36th pg.149; 1935, 37th pg.179; 1936, 38th pg.174; 1937, 39th pg.161.
Five Bars Mining - Middle Fork Boise (see Stanley Five Bars) - most likely part of the Boise King property in the Atlanta Dist.	E.D.Watters, Boise	1921, 23rd pg.57.
Goodenough Placer - Middle Fork Boise leased from John & Grace Kinsela, P.H. & Vera C. Quirk, and John and Myrtle Jedlick all of Boise	Frank Clinkhammer & John C. Hibbard	1939, 41st pg.201.

Table A-4. Summary of placer properties adjacent to the Breadwinner study area and mentioned in Idaho Inspector of Mines Annual Reports, 1921 to 1942 -- continued

Property or Company - Approx. Locat.	Owner(s), P.O.	Rpts. for the Year and page
Elmore County - continued		
Last Chance - Twin Springs	Cyrus H. Pickens, Twin Springs	1921, 23rd pg.58; 1922, 24th pg.87; 1923, 25th, pg.100; 1924, 26th pg.112; 1925, 27th pg.133; 1926, 28th pg.129; 1927, 29th pg.135; 1928, 30th pg.128; 1929, 31st pg.147; 1930, 32nd pg.151; 33rd pg.142; 1932, 34th pg.138; 1933, 35th pg.132.
Lucky Boy - Twin Springs	John Pfasser, Barber	1921, 23rd pg.58; 1922, 24th pg.87; 1923, 25th, pg.100.
New Liberty - Twin Springs/Middle Fork Boise	Oliver O. Haga, Boise	1942, 44th pg.113-4.
leased to Colonel O.B.Perry, San Francisco - most likely part of the Boise King property in the Atlanta Dist.		
North Fork - Twin Springs	Frank Struckman, Barber	1921, 23rd pg.58; 1922, 24th pg.87; 1923, 25th, pg.100.
Northwest Devel. Co. - Boise River	Willaim Williams, Boise; Geo. L. Fleharty, W. L. Prunty, Ponca City, Ok.; R.S. Cartright, E.C.Gladieux	1927, 29th pg.133; 1928, 30th pg.127; 1929, 31st pg.146; 1930, 32nd pg.149; 1931, 33rd pg.139; 1932, 34th pg.137; 1933, 35th pg.130; 1934, 36th pg.150; 1935, 37th pg.180; 1936, 38th pg.175.
Sheep Creek Mining - Twin Springs	John J. Kinsela, Boise; Grace M. Kinsela, Twin Springs	1937, 39th pg.162; 1938, 40th pg.154; 1939, 41st pg.201.
Stanley-Five Bars Mng. - see appendix , this is part of the Boise King property in the Atlanta Dist.		
Sunrise - Twin Springs	John Vaughn, Twin Springs	1921, 23rd pg.58; 1922, 24th pg. 87; 1923, 25th, pg.100; 1924, 26th pg.113; 1925, 27th pg.134; 1926, 28th pg.129; 1927, 29th pg.135; 1928, 30th pg.128; 1929, 31st pg.147; 1930, 32nd pg.151; 33rd pg.142; 1932, 34th pg.138; 1933, 35th pg.132; 1934, 36th pg.152; 1935, 37th pg.182; 1936, 38th pg.177; 1937, 39th pg.164.

APPENDIX B

Rock and placer sample descriptions and analyses from the Steel Mountain/Yuba River and Breadwinner study areas, listed by Property.

Table B-1. Descriptions and analyses of rock samples from the Steel Mountain/Yuba River study area, listed by Property.
[Au, gold; Ag, silver; Cu, copper; Pb, lead; Zn, zinc; As, arsenic; Sb, antimony; W, tungsten; Mn, manganese; Bi, bismuth; Mo, molybdenum; Hg, mercury; ppb, part per billion; ppm, part per million; oz/ton, troy ounce per short ton; <, less than; %, percent; psuedomorphs after pyrite are iron oxides]

Sample Number	Sample Descriptions	Au (ppb)	Au (oz/ton)	Ag (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	As (ppm)	Sb (ppm)	W (ppm)	Mn (ppm)	Bi (ppm)	Mo (ppm)	Hg (ppb)
	Yuba Group (fig. 4)													
22	Select sample - altered batholith rocks; sericite, silicification, pyrite, arsenopyrite, and oxides of iron and arsenic	2145	0.063	1.0	7	26	30	6750	12	<10	410	<5	4	150
23	Grab sample from dump - altered (?) batholith rocks; some iron oxides throughout, and minor vein quartz and psuedomorphs after pyrite	3410	0.100	1.8	7	24	68	1840	<5	<10	325	<5	2	105
26	Select sample - quartz, clay, sericite, some banded quartz veinlets, pyrite, and arsenopyrite - soft-crumbly material from small stockpile	1320	0.039	2.3	6	40	80	3.1%	48	<10	182	<5	75	850
59	Select sample - altered batholith rocks; some iron oxide and silicification	33		<0.2	3	16	42	23	<5	<10	362	<5	2	40
	Camp Creek Lode (fig. 4)													
24	Chip sample, 0.94-m length - zone of altered batholith rocks; quartz veinlets quartz replacement, sericite, and psuedomorphs after pyrite; zone strikes N. 80° E., dips 75° to 80° SE.	2105	0.061	1.7	4	92	72	158	<5	<10	85	<5	1	75
25	Select sample - altered batholith rocks; quartz veinlets, and some chlorite and/or epidote and psuedomorphs after pyrite	285		0.6	4	45	88	74	<5	<10	90	<5	2	25
107	Select sample - vein quartz and silicified batholith rocks; pyrite, iron oxides, and pseudomorphs after pyrite	14850	0.434	9.1	15	230	107	135	<5	<10	20	<5	10	260
	Little Queen or XYZ Tungsten (fig. 2)													
28	Select sample - altered batholith rocks; quartz veinlets and quartz replacement, pyrite and pseudomorphs after pyrite, and chlorite and/or epidote	205		<0.2	3	110	34	335	<5	<10	23	<5	1	<10
29	Chip sample, 1.07-m length - quartz vein, and altered batholith rocks; green altered feldspar (chlorite and /or epidote) and iron oxide	72		<0.2	3	22	7	108	<5	<10	45	<5	1	<10
104	Grab sample - pod of bull quartz 4.5-m wide by 15-m long with minor iron oxides on fracture surfaces	28		<0.2	5	6	2	<5	<5	<10	32	<5	1	<10
105	Select sample - iron oxide stained silicified batholith rocks; near scarp trending N. 70° W.	75		1.4	12	24	9	56	<5	<10	18	<5	12	30
	Grouse Creek claim group (fig. 4)													
48	Chip sample, 0.79-m length - fault shear gouge of batholith rocks; iron oxides, and quartz vein; trend of vein N. 65° E.	2705	0.079	0.4	2	10	10	2725	<5	12	48	<5	2	60

Table B-1. Descriptions and analyses of rock samples from the Steel Mountain/Yuba River study area - continued

Sample Number	Sample Descriptions	Au (ppb)	Au (oz/ton)	Ag (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	As (ppm)	Sb (ppm)	W (ppm)	Mn (ppm)	Bi (ppm)	Mo (ppm)	Hg (ppb)
	Grouse Creek claim group - continued													
49	Select sample - altered, fractured-to-sheared batholith rocks; iron oxide and quartz veinlets	1355	0.040	0.2	4	17	41	4610	<5	<10	52	<5	1	80
50	Select sample - vein quartz with disseminated pyrite casts and minor arsenic oxide	525	0.015	0.3	2	51	7	545	<5	<10	18	<5	1	35
51	Chip sample, 3.35-m length - altered fractured-to-sheared batholith rocks; iron oxide, and quartz veins with pyrite and arsenopyrite	3830	0.112	39	10	26	37	2665	<5	<10	87	<5	5	210
52	Select sample - quartz-rich altered batholith rocks with pyrite and arsenopyrite; over 5% sulfides	1085	0.032	28	4	30	10	640	<5	10	2	45	8	1115
53	Chip sample, 1.04-m length - fractured quartz vein with iron oxide; vein trends north and is cut by east-trending shear zone	12330	0.360	33	50	83	34	1850	<5	<10	130	<5	5	115
54	Select sample - soft, altered batholith rocks; argillite, sericite, iron oxides, and some silicification	105		1.5	3	17	73	632	<5	<10	167	<5	1	170
55	Select sample - fractured quartz vein with dark stain; adjacent to sample site 54	3245	0.095	160	20	34	20	305	<5	<10	106	<5	1	185
56	Select sample - vein quartz with minor iron oxides, argillite, and sericite	250		1.3	3	15	27	85	<5	<10	370	5	2	540
57	Select sample - vein quartz with iron oxide fracture coatings	225		38	4	360	33	210	<5	<10	240	385	2	3650
58	Select sample - vein quartz with fine grains of arsenopyrite and pyrite, and oxides of iron and arsenic	5020	0.147	0.6	3	10	7	1.1%	<5	<10	26	<5	6	160
60	Chip sample, 0.40-m length - gray fault gouge strikes due east to N. 75° E., dips 55° to 70° SE.	420	0.012	0.4	2	12	57	115	<5	<10	197	<5	30	60
61	Chip sample, 1.22-m length - altered batholith rocks fractured to fault gouge, with some iron oxides	90		0.2	3	20	63	30	<5	<10	280	<5	1	30
62	Select sample - gray fault gouge with crushed vein quartz and some iron oxides	1030	0.030	0.5	4	17	61	330	<5	<10	195	<5	2	50
63	Select sample - fractured-rock to fault-gouge of vein quartz with iron oxides	470	0.014	0.2	8	17	60	985	<5	<10	20	<5	2	40

Table B-1. Descriptions and analyses of rock samples from the Steel Mountain/Yuba River study area - continued

Sample Number	Sample Descriptions	Au (ppb)	Au (oz/ton)	Ag (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	As (ppm)	Sb (ppm)	W (ppm)	Mn (ppm)	Bi (ppm)	Mo (ppm)	Hg (ppb)
	Lead Nickel (fig. 4)													
64	Grab sample - altered batholith rocks; sericite, silicification and minor quartz veinlets, and minor iron oxide	265		<0.2	2	23	20	238	<5	<10	292	<5	1	25
65	Select sample - altered, highly silicified batholith rocks with disseminated and streaks of pyrite and arsenopyrite, quartz-crystal-lined vugs, and oxides of iron and arsenic	98500	2.88	8.1	7	420	693	2.6%	40	15	21	<5	1	750
66	Chip sample, 0.46-m length - altered batholith rocks; argillite, sericite, quartz veinlets, and iron oxides; shear gouge; structure strikes N. 70° to 75° E., dips 45° NW.	32950	0.962	0.3	2	66	15	4205	<5	<10	45	<5	1	35
81	Select sample - altered batholith rocks; silicification, pyrite, arsenopyrite, oxides of iron and arsenic, and pseudomorphs after pyrite	2675	0.078	0.3	2	12	14	6080	<5	<10	35	<5	1	65
	Miscellaneous Prospects between the Yuba River and the Trail Creek (fig. 4)													
78	Select sample - altered batholith rocks with silicification to complete replacement by quartz, sericite, iron oxides and psuedomorphs after pyrite	130		0.2	3	17	10	230	<5	<10	64	<5	<1	<10
79	Chip sample, 2.44-m length - fractured to fault gouge of altered batholith rocks; quartz veinlets, quartz crystal lined vugs, psuedomorphs after pyrite, and oxides of iron and arsenic; structure strikes N. 50° W., dips 45° to 50° NE.	3875	0.113	0.6	2	26	12	530	<5	<10	15	<5	<1	10
80	Select sample - white vein quartz or completely replaced, altered batholith rocks; pyrite, arsenopyrite, psuedomorphs after pyrite, and oxides of iron and arsenic	13480	0.394	5.3	4	145	28	3305	<5	<10	24	<5	1	75
	Upper Decker Creek (fig. 2)													
93	Chip sample, 0.61-m length - quartz vein with massive to comb quartz, pyrite, galena, sphalerite, iron oxides, and chlorite; vein strikes N. 20° W. to N. 10° E., dips 55° north	395	0.012	11	63	3780	2960	12	<5	50	82	10	4	605
94	Select sample - massive to comb quartz and quartz rich breccia with pyrite, galena, sphalerite, iron oxides and gossan, and chlorite - from small stockpile	1440	0.042	56	61	9650	1.8%	22	<5	295	102	6	17	650
106	Select sample - altered (?) batholith rocks with iron oxides and psuedomorphs after pyrite	210		7.3	14	22	24	13	<5	<10	67	<5	2	35

Table B-1. Descriptions and analyses of rock samples from the Steel Mountain/Yuba River study area - continued

Sample Number	Sample Descriptions	Au (ppb)	Au (oz/ton)	Ag (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	As (ppm)	Sb (ppm)	W (ppm)	Mn (ppm)	Bi (ppm)	Mo (ppm)	Hg (ppb)
	Samples from East side of study area (fig. 2)													
95	Select sample - altered (?) batholith rocks; iron oxide stain, psuedomorphs after pyrite, some sericite, and some chlorite and/or epidote	30		16	3	560	230	116	<5	<10	25	38	1	275
96	Select sample - altered (?) batholith rocks; iron oxide stain, psuedomorphs pyrite, and some sericite	15		1.0	3	50	7	17	<5	<10	20	5	2	146
97	Chip sample, 1.37-m length - massive vein quartz to highly silicified batholith rocks; iron oxides and psuedomorphs after pyrite; vein strikes N. 60° to 83° E., dips 74° SE. to vertical to slightly overturned	18		0.9	4	55	13	15	<5	<10	2	6	21	50
98	Select sample - massive white vein quartz to highly silicified batholith rocks; iron oxides and psuedomorphs after pyrite, and minor fresh pyrite; vein strikes N. 45° to 60° E., dips near vertical	25		0.3	3	54	24	44	<5	<10	2	<5	18	25
108	Select sample - altered batholith rocks; quartz veinlets, iron oxides and psuedomorphs after pyrite	370	0.011	4.3	28	68	142	4150	<5	<10	95	6	2	265
109	Select sample - altered batholith rocks; silicification, iron oxides and minor psuedomorphs after pyrite; iron-oxide stained area 30 m by 8 m	135		2.0	48	8	18	162	<5	<10	42	<5	2	50
	Spanish Town (fig. 5)													
16	Select sample - vein quartz and altered batholith rocks; pyrite, arsenopyrite, oxides of iron and arsenic, and psuedomorphs after pyrite, and some comb quartz	8305	0.243	4.6	5	1960	57	5510	16	20	53	<5	2	330
17	Select sample - altered batholith rocks; quartz veinlets, sericite, iron oxides, and psuedomorphs after pyrite	150		<0.2	4	29	12	230	<5	<10	165	<5	1	10
18	Select sample - soft material on ridge top believed to be deeply weathered, altered batholith rocks with iron oxide stain	1235	0.036	0.9	15	130	18	1900	<5	<10	17	<5	1	125
19	Select sample - same as sample 18 except no iron oxide stain (light gray color) and visible gold in this material when panned	3090	0.090	0.8	4	36	19	430	<5	<10	250	<5	1	380
20	Grab, 2.4-m length - fractured and altered batholith rocks; sericite, some iron oxides, and minor quartz veinlets	203		<0.2	3	20	19	710	<5	<10	138	<5	2	35
38	Chip sample, 1.22-m length - fractured, sheared and altered batholith rocks; sericite, iron oxides, broken vein quartz, pyrite, arsenopyrite, and some chlorite and epidote; zone strike N. 10° to 35° E., dip 24° to 38° SE.	585	0.017	0.4	2	65	26	3025	<5	<10	25	<5	2	100

Table B-1. Descriptions and analyses of rock samples from the Steel Mountain/Yuba River study area - continued

Sample Number	Sample Descriptions	Au (ppb)	Au (oz/ton)	Ag (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	As (ppm)	Sb (ppm)	W (ppm)	Mn (ppm)	Bi (ppm)	Mo (ppm)	Hg (ppb)
	Spanish Town - continued													
39	Select sample - same as sample 38 except selected pieces with more pyrite and arsenopyrite	350	0.010	<0.2	2	27	12	5520	<5	<10	16	<5	1	50
40	Chip sample, 0.30-m length - quartz veinlet and silicified batholith rocks; iron oxides, psuedomorphs after pyrite and some shearing; vein strikes N. 78° E., dips 76° SE.	11680	0.341	4.6	10	50	26	102	<5	<10	305	<5	1	65
41	Chip sample, 0.61-m length - shear gouge of crushed, altered batholith rocks; iron oxides; shear strikes N. 80° E., dips 85° NW.	203		0.2	3	24	31	112	<5	<10	163	<5	1	185
42	Select sample - highly silicified batholith rocks with disseminated pyrite and streaks of gray in quartz	38		<0.2	3	27	27	32	<5	<10	360	<5	<1	30
43	Chip sample, 0.91-m length - silicified batholith rocks; quartz veinlets, pyrite, and iron oxides; one veinlet strikes N. 65° E., dips near vertical	23		0.2	4	15	13	52	<5	<10	125	<5	<1	205
44	Select sample - altered batholith rocks; quartz veinlets and comb quartz, iron oxides and psuedomorphs after pyrite, and sericite	375	0.011	0.3	4	14	11	255	<5	<10	30	<5	2	35
45	Select sample - altered batholith rocks; quartz veinlets, iron oxides and psuedomorphs after pyrite, and sericite	230		<0.2	1	15	7	410	<5	<10	63	<5	1	30
46	Select sample - altered batholith rock; iron oxides, sericite, and minor quartz veinlets	295		<0.2	2	17	14	270	<5	<10	62	<5	<1	20
	Cayuse Point-Pony Ridge area (fig. 2)													
4	Select sample - altered (?) batholith rocks sericite, iron oxides, and some quartz veinlets	18		0.2	21	120	31	17	<5	<10	214	<5	2	90
5	Select sample - altered (?) batholith rocks; sericite and iron oxides	5		<0.2	13	48	15	<5	<5	<10	92	<5	1	55
6	Select sample - light-colored apalite and pegmatite with iron oxides and psuedomorphs after pyrite, minor reddish garnet	12		<0.2	11	38	18	5	<5	<10	97	<5	1	20
7	Select sample - altered batholith rocks; sericite, quartz veinlets, iron oxides and psuedomorphs after pyrite	40		<0.2	9	53	20	42	<5	<10	31	<5	2	35
8	Select sample - pegmatite and batholith rocks with sericite, iron oxides, psuedomorphs after pyrite along fractures, and minor garnets	18		<0.2	6	32	19	13	<5	<10	110	<5	1	15
92	Grab chip - 9.14-m length of altered batholith rocks; quartz veinlets, iron oxides, and psuedomorphs after pyrite	40		0.5	4	72	46	26	<5	<10	24	<5	6	20

Table B-1. Descriptions and analyses of rock samples from the Steel Mountain/Yuba River study area - continued

Sample Number	Sample Descriptions	Au (ppb)	Au (oz/ton)	Ag (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	As (ppm)	Sb (ppm)	W (ppm)	Mn (ppm)	Bi (ppm)	Mo (ppm)	Hg (ppb)
	RDO claim group (fig. 5)													
87	Grab sample - along 1.68-m length of white vein quartz, iron oxides and psuedomorphs after pyrite, arsenic oxides, and minor fresh pyrite	95		1.7	3	130	30	3350	<5	40	60	5	2	145
88	Select sample - altered batholith rocks; white vein quartz, some iron oxides and minor psuedomorphs after pyrite	247		0.2	4	21	20	10	<5	<10	54	<5	<1	10
89	Grab sample - along 1.82-m length of altered, highly silicified batholith rocks; quartz veinlets, iron oxides and psuedomorphs after pyrite; dark green dike next to sample location strikes north to N. 20° E., dips near vertical SE.	52		0.8	4	35	38	172	<5	<10	190	<5	1	65
90	Chip sample, 0.36-m - altered batholith rocks; white vein quartz with iron oxides and psuedomorphs after pyrite; vein strikes N. 75° to 80° E., dips near vertical	68		87	3	740	104	325	<5	75	35	285	1	1035
91	Select sample - altered batholith rocks; sericite, quartz veinlets, and iron oxides and psuedomorphs after pyrite	20		0.5	3	26	48	320	<5	<10	30	<5	1	40
103	Select sample - altered (?) batholith rocks with some iron oxides, and some pegmatite veins	30		<0.2	3	12	22	<5	<5	<10	122	<5	1	<10
	RST claim group (fig. 2)													
84	Select sample - altered (?) batholith rocks with iron oxide stain	12		<0.2	3	13	24	9	<5	<10	118	<5	<1	<10
85	Select sample - altered (?) batholith rocks with iron oxide stain and some chlorite	<5		<0.2	3	10	20	5	<5	<10	78	<5	<1	<10
86	Select sample - altered batholith rocks; sericite, minor quartz veinlets, iron oxides and psuedomorphs after pyrite, and minor fresh pyrite	185		<0.2	4	24	32	110	<5	<10	220	<5	2	10
101	Grab sample - batholith rocks and some pegmatite vein	8		<0.2	3	15	35	<5	<5	<10	183	<5	1	<10
102	Grab sample - along 1-m of subvolcanic dike with iron oxides and psuedomorphs after pyrite; dike strikes N. 10° E., dips 45° SE.	10		<0.2	12	20	43	<5	<5	<10	105	<5	2	15

Table B-2. Placer sample descriptions and analyses from the Steel Mountain/Yuba River study area.
[mg, milligram; g, gram; yd^3, cubic yard; <, less than; gold value per yd^3 based on $350 per troy ounce; Non-mag, the non-magnetic fraction of the heavy minerals recovered; Radioactivity, count given from concentrates using an EG&E GR-110 scintillometer]

Sample Number	Sample Description	Gold (mg)	Gold value (per yd^3)	Count of gold pieces	Sluice concentrates (g)	Magnetite (g)	Non-mag (g)	Radioactivity
1	Three Fork Creek: active gravel bar, no workings	1.050	$0.118	4	914.6	44.79	24.00	<10
2	West fork of Cayuse Creek: active gravel bar, no workings	0			1336.7	7.89	24.04	<10
3	Sand Creek: mix of active gravel bar and colluvium, no workings	0			604.8	28.55	22.33	<10
9	Elk Creek: active gravel bar, no workings	1.069	0.120	5	739.6	5.86	20.00	<10
10	Alta Creek: active gravel bar, no workings	0			952.5	18.26	28.50	<10
11	Pinto Creek: mix of active gravel bar and colluvium, no workings	0.082	0.009	1	1233.4	23.51	22.46	<10
12	Steel Creek: active gravel bar, no workings	0.024	0.003	1	1043.0	21.57	26.78	16
13	Elk Creek: active gravel bar, no workings	1.650	0.186	15	1042.0	5.53	15.10	<10
14	East Fork Elk Creek: active gravel bar, no workings	3.072	0.346	17	823.6	19.74	27.37	<10
15	Elk Creek: active gravel bar, no workings	0.283	0.032	5	766.2	15.37	44.79	<10
21	Elk Creek: elevated gravel, adjacent placer workings, mostly unwashed material	28.937	3.256	99	928.4	22.56	23.00	<10
27	Yuba River: active gravel bar, no workings	5.416	0.609	88	1047.7	99.13	28.11	13
30	Yuba River: active gravel bar, no workings	0.538	0.061	7	705.4	68.06	29.88	15
31	Flint Creek: active gravel bar, no workings	0.274	0.031	1	650.7	10.37	17.97	<10
32	Decker Creek: active gravel bar, no workings	1.461	0.164	8	956.2	22.23	30.23	<10
33	Decker Creek: active gravel bar, no workings	0.343	0.039	3	890.6	14.23	21.12	<10
34	Grouse Creek: elevated gravel, adjacent placer workings, mostly unwashed material	3.873	0.436	10	661.5	21.60	21.83	<10
35	Grays Creek: active gravel bar, no workings	0.006	0.001	1	684.0	6.32	16.74	<10
36	M. F. Boise: active gravel bar, no workings	0.011	0.001	1	758.8	2.55	20.43	<10

Table B-2. Placer sample descriptions and analyses from the Steel Mountain/Yuba River study area - continued

Sample Number	Sample Description	Gold (mg)	Gold value (per yd^3)	Count of gold pieces	Sluice concentrates (g)	Magnetite (g)	Non-mag (g)	Radioactivity
37	Decker Creek: active gravel bar, no workings, across creek from mill ruins, amalgam and mercury found	77.238	8.692	319	935.0	43.55	32.33	<10
67	Trail Creek: mix of active gravel bar and colluvium, no workings	0.193	0.022	5	777.4	43.88	42.08	<10
68	Yuba River: active gravel bar, no workings	10.766	1.211	112	900.3	95.07	44.22	19
69	Yuba River: sample from old test pit in vegetated soil-covered gravel over 30 m from river, no adjacent placer tailings, amalgam and mercury found	3.691	0.415	34	817.0	38.25	101.68	<10
70	Mid. Fk. Boise: elevated gravel, adjacent placer workings, mostly unwashed material	3.452	0.388	44	516.8	23.53	87.55	<10
71	Mid. Fk. Boise: active gravel bar, no workings, amalgam and mercury found	18.099	2.037	425	1062.4	55.19	96.41	12
72	Mid. Fk. Boise: elevated gravel, adjacent placer workings, mostly unwashed material	60.164	6.770	189	859.2	38.49	95.26	<10
73	Mid. Fk. Boise: toe of alluvial fan at mouth of unnamed canyon; toe is being reworked by Boise River, no workings	0.382	0.043	4	672.1	14.05	57.66	<10
74	Mid. Fk. Boise: active gravel bar, no placer workings, but test pits and trenches on top of this large bar	68.259	7.681	1403	754.3	41.23	76.04	28
75	Mid. Fk. Boise: active gravel bar, no workings, maybe one piece of gold with amalgam	31.513	3.546	709	801.0	28.29	77.34	15
76	Mid. Fk. Boise: elevated gravel, adjacent placer workings above and below sample site, may be some unwashed material	8.057	0.907	46	680.6	28.34	76.82	<10
77	Mid. Fk. Boise: active gravel bar, adjacent old placer workings covered by trees; old test pits and a ditch on top of this large bar, mostly unwashed material	88.829	9.996	1397	739.0	56.33	88.34	20
82	Yuba River: mix of active gravel bar and colluvium, above adjacent placer workings	5.225	0.588	50	619.3	32.10	100.07	<10
83	Mid. Fk. Boise: elevated gravel, adjacent placer workings, mostly unwashed material	8.149	0.917	23	732.5	24.00	84.66	<10

Table B-3. Descriptions and analyses of rock samples from the Breadwinner study area, listed by Property.
[Au, gold; Ag, silver; Cu, copper; Pb, lead; Zn, zinc; As, arsenic; Sb, antimony; W, tungsten; Mn, manganese; Bi, bismuth; Mo, molybdenum; Hg, mercury; ppb, part per billion; ppm, part per million; oz/ton, troy ounce per short ton; <, less than; %, percent; psuedomorphs after pyrite are iron oxides]

Sample Number	Sample Descriptions	Au (ppb)	Au (oz/ton)	Ag (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	As (ppm)	Sb (ppm)	W (ppm)	Mn (ppm)	Bi (ppm)	Mo (ppm)	Hg (ppb)
	Twin Springs area (fig. 3)													
38	Chip sample, 1.22-m length - altered Tertiary igneous rocks; argillite, iron oxides, and some chlorite; alteration found along structure trending N. 40° to 60° E., dipping NW. (?)	30		0.7	11	32	110	15	<5	<10	75	<5	3	165
40	Select sample - altered (?) Tertiary igneous rocks with iron oxides	15		<0.2	7	8	129	<5	<5	<10	142	<5	2	80
41	Select sample - altered Tertiary igneous rocks; argillite, some sericite (?), iron oxides, and psuedomorphs after pyrite	18		0.5	57	13	105	8	<5	<10	60	<5	3	145
42	Chip sample, 0.85-m length - altered Tertiary igneous rocks; bands of quartz veinlets and veins, iron oxides, pyrite, unidentified gray sulfide, and yellow oxide stain (molybdenum ?); zone strikes N. 5° to 10° W., dips 75° SW.	25		13	23	45	212	5	<5	10	20	50	27	575
47	Select sample - fine-to medium-grained biotite granite with seams and blebs of much coarser pyrite, molybdenite, quartz, feldspar, and epidote	10		4.1	255	71	16	18	<5	<10	118	30	325	370
51	Select sample - over 0.6-m-wide zone of dark-stained Tertiary igneous rock; staining believed to be manganese and iron oxides; zone strikes N. 50° W., dips 55° SE.	25		9.3	17	1635	545	12	5	<10	7750	35	5	225
	Hy Country claim group (fig. 3)													
1	Chip sample, 1.68-m length - massive to highly fractured vein quartz and altered batholith rocks with some iron oxides and psuedomorphs after pyrite, and some chlorite; vein strikes N. 30° to 35° E., dips 75° SE.	63		1.5	6	33	30	<5	<5	<10	101	<5	2	35
2	Select sample - massive and brecciated, white vein quartz with pyrite, some chlorite, and some iron oxides	1660	0.048	40	22	122	116	250	5	<10	52	<5	60	105
3	Select sample - vein quartz with iron oxides and psuedomorphs after pyrite, some fresh pyrite	1905	0.056	24	15	101	57	132	<5	<10	50	<5	20	110
4	Chip sample, 3.96-m length - shear zone with highly fractured batholith rocks, breccia recemented with quartz, iron oxides and psuedomorphs after pyrite, and minor pyrite; zone strikes N. 40° E., dips 81° NW.	40		<0.2	4	36	28	9	<5	<10	133	<5	3	45
	Three Tree claim group (fig. 3)													
8	Grab sample - tan-colored, weathered or altered Tertiary igneous rocks and some pegmatite	5		<0.2	4	12	10	<5	<5	<10	72	<5	2	20

Table B-3. Descriptions and analyses of rock samples from the Breadwinner study area, listed by Property - continued

Sample Number	Sample Descriptions	Au (ppb)	Au (oz/ton)	Ag (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	As (ppm)	Sb (ppm)	W (ppm)	Mn (ppm)	Bi (ppm)	Mo (ppm)	Hg (ppb)
	Three Tree claim group - continued													
9	Select sample - altered (?) Tertiary igneous rocks with iron oxides and psuedomorphs after pyrite	15		<0.2	5	21	11	<5	<5	<10	30	<5	<1	215
10	Select sample - altered (?) Tertiary igneous rocks with sericite and iron oxides	5		<0.2	2	19	9	<5	<5	<10	95	<5	<1	<10
11	Select sample - dike rock (?) with iron oxides and psuedomorphs after pyrite	<5		2.4	20	27	20	<5	<5	<10	145	<5	8	780
	Prospect in section 23 (fig. 3)													
49	Select sample - altered Tertiary igneous rocks; sericite, quartz veinlets, iron oxides and psuedomorphs after pyrite, and some chlorite	235		17	155	150	1890	140	220	30	40	165	10	680
50	Select sample - altered Tertiary rocks mostly replaced by vein quartz with iron oxides and psuedomorphs after pyrite, and fresh pyrite	55		13	152	182	418	48	8	<10	162	18	28	110
	Prospect in section 32 (fig. 3)													
26	Select sample - vein quartz and altered Tertiary igneous rocks; sericite, iron oxides and psuedomorphs after pyrite, and some fresh pyrite	240		4.4	6	75	24	590	5	<10	31	5	10	250
	Reconnaissance samples (fig. 3)													
23	Select sample - altered batholith rocks; quartz veinlets, sericite, iron oxides, and psuedomorphs after pyrite	20		1.2	15	28	11	55	<5	<10	48	<5	3	365
24	Select sample - altered batholith rocks; argillite, sericite, iron oxides, and psuedomorphs after pyrite	<5		<0.2	9	21	6	12	<5	<10	20	<5	4	60
25	Select sample - altered batholith rocks; sericite, quartz veinlets, iron oxides, and psuedomorphs after pyrite	12		0.8	44	31	20	15	<5	<10	82	<5	15	155
27	Select sample - altered batholith rocks; sericite (?), quartz veinlets, iron oxides, and psuedomorphs after pyrite	10		1.5	13	91	29	18	<5	<10	176	16	1	220
28	Select sample - altered batholith rocks (?); iron oxide and no biotite	12		<0.2	5	35	40	<5	<5	<10	380	<5	1	20
29	Select sample - altered batholith rocks (?); iron oxide, no biotite, and minor quartz veinlets	15		<0.2	23	22	41	<5	<5	<10	258	<5	1	75

Table B-4. Placer sample descriptions and analyses from the Breadwinner study area.
[mg, milligram; g, gram; yd^3, cubic yard; <, less than; gold value per yd^3 based on $350 per troy ounce; Non-mag, the non-magnetic fraction of the heavy minerals recovered; Radioactivity, count given from concentrates using an EG&E GR-110 scintillometer]

Sample Number	Sample Description	Gold (mg)	Gold value (per yd^3)	Count of gold pieces	Sluice concentrates (g)	Magnetite (g)	Non-mag (g)	Radioactivity
5	Mid. Fk. Boise, active gravel bar, no workings	2.559	0.288	79	795.7	21.62	38.24	14
6	Mid. Fk. Boise, active gravel bar, no workings	3.792	0.427	122	918.9	22.83	28.00	16
7	Mid. Fk. Boise, elevated gravel, adjacent placer tailings, mostly unwashed material	50.922	5.730	111	631.5	17.28	26.39	<10
12	Mid. Fk. Boise, elevated gravel, adjacent placer tailings, may be half unwashed material	11.245	1.265	712	868.7	26.17	27.35	<10
13	Mid. Fk. Boise, elevated gravel, adjacent placer tailings, below high water mark of Arrowrock Reservoir, loose material worked by wave action (?) or previously washed	0.939	0.106	51	696.7	22.68	32.65	17
14	Mid. Fk. Boise, elevated gravel, adjacent placer tailings, may be half unwashed material	11.234	1.264	65	523.3	9.29	14.27	<10
15	Mid. Fk. Boise, active gravel bar, no workings	7.300	0.821	233	723.8	11.16	21.32	11
16	Mid. Fk. Boise, elevated gravel, adjacent placer tailings, mostly unwashed material	46.546	5.238	245	749.6	5.10	15.00	13
17	Mid. Fk. Boise, active gravel bar, no workings	8.370	0.942	121	551.9	8.84	15.17	14
18	Mid. Fk. Boise, elevated gravel, adjacent placer tailings, mostly unwashed material	41.600	4.681	330	814.3	18.47	22.50	<10
19	Mid. Fk. Boise, elevated gravel over 100 m above river, adjacent placer tailings, mostly unwashed material	14.990*	6.823*	111*	573.2	8.70	13.69	<10
20	Mid. Fk. Boise, elevated gravel, adjacent placer tailings above and below sample site, most of material maybe previously washed	1.819	0.205	47	562.6	8.37	13.43	<10
21	Mid. Fk. Boise, active gravel bar, no workings	8.455	0.951	160	556.2	15.81	23.69	20
22	Cottonwood Creek, active stream, no workings	0.040	0.005	3	835.3	4.11	18.88	<10
30	North Fk. Boise, active gravel bar, no workings	15.735	1.771	147	662.3	0.80	15.13	23
31	North Fk. Boise, active gravel bar, no workings	8.476	0.954	177	634.1	3.61	27.29	42

* sample 19's volume was only 0.019 m^3 (0.025 yd^3) or ¼th the volume all other placer samples.

Table B-4. Placer sample descriptions and analyses from the Breadwinner study area - continued

Sample Number	Sample Description	Gold (mg)	Gold value (per yd^3)	Count of gold pieces	Sluice concentrates (g)	Magnetite (g)	Non-mag (g)	Radio-activity
32	North Fk. Boise, active gravel bar, no workings	91.984	10.351	278	894.5	7.89	24.18	26
33	North Fk. Boise, active gravel bar, no workings	0.281	0.032	7	724.7	3.83	22.35	13
34	Mid. Fk. Boise, active gravel bar, no workings	9.080	1.022	459	679.9	3.57	13.18	11
35	Mid. Fk. Boise at mouth of North Fk., active gravel bar, no workings	5.323	0.599	124	962.6	15.89	27.70	17
36	Mid. Fk. Boise, elevated gravel, adjacent placer tailings above and below sample site, most of material may be previously washed	5.971	0.672	128	906.1	31.70	29.47	16
37	Mid. Fk. Boise, elevated gravel, adjacent placer tailings above and below sample site, most of material may be previously washed and/or slope wash	9.252	1.041	122	730.0	18.00	25.04	11
39	Browns Creek, active stream, no workings	0			442.6	2.26	13.05	<10
43	Mid. Fk. Boise, active gravel bar, no workings	15.636	1.760	327	702.6	20.55	31.00	27
44	Mid. Fk. Boise, elevated gravel, adjacent placer tailings, mostly unwashed material	34.492	3.881	361	607.4	3.00	11.65	<10
45	Mid. Fk. Boise, elevated gravel, adjacent placer tailings above and below sample site, most of material may be previously washed	1.013	0.114	26	830.3	10.86	17.85	<10
46	Mid. Fk. Boise, active gravel bar, no workings	2.092	0.235	58	499.8	9.99	20.56	<10
48	Mid. Fk. Boise, elevated gravel over 300 m above river, adjacent placer tailings, mostly unwashed material, sample 19 also taken at this site	28.666	3.226	240	638.7	16.81	20.94	<10

APPENDIX C

Discussion of statistical methods

Discussion of Statistical Methods

"The analysis of data inevitably involves some trafficking with the field of statistics, that gray area which is as surely not a branch of mathematics as it is neither a branch of science " (Press and others, 1986, p. 454). Statistical analysis of rock sample results is used to characterize deposit type, to determine trace metal correlations, and to estimate anomalous values. Statistical analysis of placer samples is primarily done to determine efficiency of sampling. The STATS+ program (Statsoft, Inc., 1988) was used to calculate descriptive statistics, histograms, correlations, and scatter plots. The PROBPLOT[2] program (Stanley, 1987) was used to plot probability graphs, which were used to estimate anomalous values.

In the study of the 27,034-hectare Steel Mountain/Yuba River study area, the 73 rock samples taken; and in the study of the 16,544-hectare Breadwinner study area, the 23 rock samples taken were considered reconnaissance data. That is, each sample (or each small grouping of samples) is relatively independent. Also, almost all samples were of altered or mineralized rocks. In addition, an assumption that Rose and others (1979, p. 34) made and that was assumed for this study is, "... that most sets of data encountered in exploration appear more nearly log-normal ... and that useful results can be obtained by assuming log-normal behavior." Descriptive statistics, histograms, scatter plots, and one set of correlations were calculated by converting rock sample analyses to log10 values. Another set of correlations was calculated using the Spearman rank method. This method tests for a relationship between two variables by converting their values to their corresponding ranks and calculating a correlation coefficient using these rank values. In a set of n samples the lowest elemental concentration would be ranked 1 and the highest would be ranked n. According to Mendenhall (1975, p. 362-363 and 386), this method is useful where the population distribution is uncertain, the hypothesis tested deals with ranked data, or where outliers have a large adverse affect on correlation values.

Like the rock samples, the 33 placer samples in the Steel Mountain/Yuba River study area and the 28 placer samples in the Breadwinner area are widely dispersed and are considered reconnaissance data. Correlation values of concentrate weights, gold weights, heavy mineral weights (magnetic and nonmagnetic), and radioactivity were calculated. The correlation values between the first three variables are very weak or insignificant, indicating no apparent problems were involved in sampling technique or sample processing.

In general terms, lode samples from the Steel Mountain/Yuba River study area are dominated by Atlanta-type mineralization and alteration as evidenced by the strong correlation value for gold-arsenic. Lode samples from the Breadwinner study area are dominated by mineralization and alteration found in Tertiary igneous rocks, and which appear to have a different geochemistry than that found associated with Atlanta-type mineralization. In the Breadwinner study area, gold in general has stronger correlation values with base metals, silver, antimony, and molybdenum; also arsenic, antimony, bismuth, molybdenum, and base metals in general have stronger correlation values with each other.

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[2]Use of trade and company names in this report are for descriptive purposes only and does not imply endorsement by the USBM.

Table C-1. Correlation matrix of rock sample analyses from the Steel Mountain/Yuba River study area - top number is correlation of data converted to log10 values and bottom number is Spearman rank correlation.

N=73

	Ag	Cu	Pb	Zn	As	Sb	W	Mn	Bi	Mo	Hg
	.52	.13	.26	.21	.74	.35	.18	-.04	-.10	.17	.44
Au	.54	*	.22	*	.74	.30	.22	*	*	.21	.47
		.46	.58	.47	.36	.19	.45	-.13	.54	.38	.76
Ag		.41	.51	.41	.37	.23	.41	*	.49	.44	.78
			.41	.47	-.13	.06	.27	.09	.10	.31	.30
Cu			.35	.31	*	*	*	*	*	.37	.30
				.72	.12	.24	.69	-.13	.52	.23	.55
Pb				.40	*	.21	.36	-.21	.41	.22	.46
					.05	.23	.61	.18	.32	.28	.46
Zn					*	.25	.24	.31	*	.26	.39
						.42	.10	-.12	-.02	.15	.47
As						.38	*	-.20	*	*	.46
							.19	.07	-.09	.26	.32
Sb							.29	*	*	*	.31
								-.10	.51	.20	.44
W								*	.49	.21	.43
									-.17	-.22	.01
Mn									*	*	*
										.19	.58
Bi										.28	.51
											.39
Mo											.40

* significance level (or probability that there is no correlation) is over 0.1

Table C-2. Correlation matrix of rock sample analyses from the Breadwinner study area - top number is correlation of data converted to log10 values and bottom number is Spearman rank correlation.

N=23

	Ag	Cu	Pb	Zn	As	Sb	W	Mn	Bi	Mo	Hg
	.64	.18	.46	.48	.70	.52	.23	-.15	.16	.40	.16
Au	.61	*	.61	.63	.57	.56	*	*	*	.41	*
		.60	.71	.57	.71	.57	.36	-.01	.59	.73	.61
Ag		.60	.81	.54	.70	.63	.39	*	.61	.79	.59
			.38	.51	.42	.44	.38	.01	.57	.71	.61
Cu			.40	.48	.44	*	.37	*	.50	.68	.59
				.57	.55	.65	.20	.51	.67	.43	.35
Pb				.55	.69	.68	*	*	.68	.60	.38
					.33	.71	.60	.28	.58	.30	.37
Zn					*	.55	.44	*	.46	*	*
						.60	.22	-.24	.41	.60	.43
As						.59	*	*	.43	.67	.45
							.58	.09	.61	.33	.31
Sb							*	*	.58	.48	*
								-.28	.59	.20	.41
W								-.40	.60	*	.44
									.17	-.13	-.12
Mn									*	*	*
										.45	.52
Bi										.46	.60
											.50
Mo											.49

* significance level (or probability that there is no correlation) is over 0.1